

## Dr. Nikolai V. Slavine

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## C U R R I C U L U M V I T A E

**Education:** 1996 Ph.D. Joint Institute for Nuclear Research (JINR), Dubna  
"Multiparticle Processes in Quark-Gluon String Model"  
1975 MS, Experimental and Theoretical Physics, Polytechnic  
University of Tomsk, "Channeling effects for charged  
Particles in crystals",

**Professional positions:** 2005 – now Assistant Professor, UT SWMC at Dallas.  
2000 – 2005 Instructor, UT SWMC at Dallas  
1999 – 2000 Research fellows, UT SWMC at Dallas  
1992 – 1999 Senior Research Scientist, JINR at Dubna  
1986 – 1992 Research Scientist, JINR at Dubna  
1979 – 1986 Junior Research Scientist, JINR at Dubna  
1975 – 1979 Junior Research Scientist, Institute for Nuclear  
Research at Tomsk

**Professional experience:** 1999 – now Theoretical investigation of light diffusion in biological  
tissues: analytical approaches and Monte Carlo  
simulation. Three Dimensional reconstructions  
algorithms for Emission (PET/SPECT, Bioluminescent  
and Fluorescent tomography) and Transmission (CT)  
Tomography. 3D Image reconstruction software with  
attenuation and scatter corrections.  
Partial Volume Effect correction in quantitative  
Multi-modal (PET/CT/MRI) Imaging analysis for early  
diagnosis of plaque deposition in Alzheimer's disease  
1991 – 1999 Visiting Scientist European Center for Nuclear  
Research (CERN) Geneva, Switzerland: Heavy Ion  
Collision experiments CMS, ALICE and WA-98.  
Theoretical investigation and Monte Carlo calculations  
of multiparticle processes in quark-gluon string model  
in Heavy Ion Collisions at High Energy.  
1977 – 1991 Data acquisition software for real-time experiments.  
Theoretical calculation and Monte Carlo simulations of  
Multiparticle production and the Leading effect in  
High Energy particle Collisions.  
1975 – 1977 Cyclotron experiments with monocrystals: positioning  
of  $^{16}\text{O}$  and  $^{12}\text{C}$  in semiconductor crystal lattice is  
determined using backward scattering of alpha  
particles. Monte Carlo studies of Shadows and  
Channeling effects for charged particles in crystals.

### Reviewer:

1. Program Committee Member, 6th Annual Biotechnology and Bioinformatics Symposium BIOT-2009  
([www.biotconf.org](http://www.biotconf.org)), Lincoln, Nebraska, USA
2. Program Committee Member, Third International Conference on Bio-inspired System and Signal  
Processing BIOSIGNALS-2010 ([www.biosignals.biostec.org](http://www.biosignals.biostec.org)), Valencia, Spain
3. Program Committee Member, 7th Annual Biotechnology and Bioinformatics Symposium  
BIOT-2010 ([www.biotconf.org](http://www.biotconf.org)), Lafayette, Louisiana, USA
4. Program Committee Member, 8th Annual Biotechnology and Bioinformatics Symposium  
BIOT-2011 ([www.biotconf.org](http://www.biotconf.org)), Houston, Texas, USA

**Professional Memberships:** American Association of Physicists in Medicine (AAPM), 2005  
Academy of Molecular Imaging (AMI), 2009  
International Society to Advice Alzheimer Research and Treatment (ISTAART), 2011.  
International Society of Computational Biology (ISCB), 2011

**Expertise:** Programming on LINUX platform, using FORTRAN, C and C++

**Scientific publications:** Over 80 (Medical Phys, IEEE Trans Nuclear Sci, Nuclear Medicine, Molecular Imaging and Biology, Applied Radiation & Isotopes, European Nucl Med & Mol. Imag, Phys Rev, Nucl.Instr&Meth et al).

**Conferences:** Inter.Conf. of Multipart. Prod. 1978-1996, Inter. Conf. High Energy Nucl Collision 1994-1998, IEEE Medical Imaging Conf. 2000-2003, Society Nuclear Medicine, 2003, Society Molec. Imaging, 2004  
Cancer Imaging Program Conf. 2001-2007, Biophys.Soc Meet. 2005.

**Honor:** Senior Res Scientist, 1997, Highest Scientific Attestation Commission, Moscow, the Best Physicist of Laboratory, JINR, 1981, 1989.

**Personal data:** born 17 December 1951, married, with two children

## **UT Southwestern Activities**

### **Patents**

1. **Slavine NV**, Antich PP, Practical Method for radioactivity distribution analysis in Small-Animal PET cancer studies©, Patent disclosure filed with University of Texas Southwestern Medical Center at Dallas in July 2007, UT # 1999.
2. **Slavine NV**, McColl RW, Kulkarni PV, 3D Image Processing and Software for Improving the Quantitative Accuracy of PET Image Recovery©, Patent disclosure filed with UT Southwestern Medical Center at Dallas in July 26, 2011, UT # 2475.
3. **Slavine NV**, A Computational Modeling Approach with Resolution Subsets for Fast PET Image Resolution Recovery©, Patent disclosure filed with UT Southwestern Medical Center at Dallas in July 28, 2011, UT # 2477
4. **Slavine NV**, McColl RW, Semi-automated Image-Processing Approach and Software for Small Animal Bioluminescence Cancer Studies©, Patent disclosure filed with UT Southwestern Medical Center at Dallas in August 9, 2011, UT # 2482

### **Peer-reviewed publications**

1. Antich P., Parkey R., **Slavine NV**, Tsyganov E., Zinchenko A., Compact Compton camera design: parameters and imaging algorithms, Proc. IEEE Nucl. Sci. Symp. & Medical Imaging Conf., **3**, pp. 2060-2067, 2000.
2. Antich P., P, **Slavine NV**, Tsyganov E., PET/SPECT detectors with light intensifiers and fiber coding, Proc. IEEE Nucl. Sci. Sym. & Med. Imaging Conf., **3**, pp. 1919-1923, 2001.
3. Antich P., Malakhov N., Parkey R., **Slavine NV**, Tsyganov E., "3D position Readout from Thick Scintillators", Nuclear Instruments and Methods, **A480**/(2/3), pp. 780-787, 2002.
4. Antich P, Constantinescu A., Mason R., McColl R., Oz O., Kulkarni P., **Slavine NV**, Tsyganov E, "FDG Imaging metastases in Copenhagen Rats on a Small Animal PET System with position-encoding fiberoptic Detectors", Nuclear Medicine, **43**(5), p. 216, 2002.
5. Tsyganov E., Buzulutskov E., Antich P., Moore J., Parkey R., Richer E., Selionine S., **Slavine NV**, Nguen N., Triple GEM structure for Medical Imaging, Proc. IEEE Nuclear Science Symp. & Medical Imaging Conf., **2**, pp. 1163-1166, 2002.

6. Zinchenko A, Tsyganov E., **Slavine NV**, Kulkarni P., Lewis M., Mason R., Oz O., Parkey R., Antich P. "Expectation Maximization Algorithm with resolution deconvolution for 3D Image reconstruction in Small Animal PET Imager", *Nuclear Medicine*, **44**(5), p. 165, 2003.
7. Tsyganov E., Antich P., Parkey R., Selionine S., **Slavine NV**, Soesbe T., Micro-SPECT Using NaI(Tl) Crystals, *Proc. IEEE Nucl. Sci. Symp. & MIC*, **3**, pp.1805-1809, 2003.
8. Jennewein M., Constantinescu A., Bergner O., **Slavine NV**, Lewis M., Zhao D., O'Kelly S., Maus S., Qaim S., Tsyganov E., Antich P., Schirrmacher R., Thrope P., Roesch F., Mason R., "Radioactive Arsenic Isotopes: New Tools for the Imaging of Tumor Targeting Antibodies", *Journal of Molecular Imaging and Biology*, **16**(150), pp. 108-117, 2004.
9. Jennewein M., Constantinescu A., Bergner O., Lewis M., Zhao D., **Slavine NV**, O'Kelly S., Maus S., Qaim S., Tsyganov E., Antich P., Roesch F., Mason R., Thrope P., "Molecular Imaging of the Vascular Targeting Antibody Vatumab<sup>®</sup> in Rat Prostate Cancer", *European Journal of Nuclear Medicine and Molecular Imaging*, **31**, pp. 264, 2004.
10. Tsyganov E., Zinchenko A., **Slavine NV**, Selionine S, Parkey R, Antich PP, "Reconstruction Algorithm with Resolution for 3D Image in a Small Animal PET Imager", *Small-Animal SPECT Imaging*, Springer Science Media Inc., Chapter **8**, pp. 163-176, 2005.
11. Lewis M., Arbique G., Richer E., **Slavine NV**, Jennewein M., Constantinescu A., Brekken R., Tsyganov E., Mason R., Antich P., "Projection and Pinhole based Data Acquisition for Small Animal SPECT using Storage Phosphor Technology", *Small-Animal SPECT Imaging*, Springer Science Media Inc., Chapter **24**, pp. 279-285, 2005.
12. Antich P., Parkey R., Selionine S., **Slavine NV**, Tsyganov E., Zinchenko A., "Application of Expectation Maximization Algorithms for Image resolution Improvement in a Small Animal PET System", *Proc. IEEE Transactions on Nuclear Science*, **52**(3), pp. 684-690, 2005.
13. Richer E., **Slavine NV**, Lewis M., Tsyganov E.N., Gellert G., Dikmen Z., Bhagwandin V., Shay V., Mason R., Antich P., "Three Dimensional Light Emission Tomography using multiple rotating CCD cameras", *Journal Molecular Imaging and Biology*, **3**(3), p. 229, 2005.
14. Jennewein M., Qaim S, Hermanne A., Jahn M., Tsyganov E., **Slavine NV**, Antich P. Kulkarni P., Thrope P., Mason R., Roesch F, "A New Method for Radiochemical Separation of Arsenic from Irradiated Germanium Oxide", *Appl Rad. & Isotopes*, **63**, pp. 343-351, 2005.
15. **Slavine NV**, Lewis M., Richer E., Antich P., "Iterative Reconstruction method for Light Emitting Sources based on the Diffusion Equation", *Medical Physics*, **33**(1), pp. 61-68, 2006.
16. Tsyganov E., Anderson J, Arbique G, Constantinescu A, Jennewein M, Kulkarni P., Mason R, McColl R, Öz O, Parkey R, Richer E, Roesch F, Selionine S, **Slavine NV**, Srivastava SC, Thorpe PE, Zinchenko AI, Antich PP: "UT SW Small Animal Positron Emission Imager", *IEEE Trans. Nucl. Sci.*, **53**(5), pp. 2591-2600, 2006.
17. Soesbe T., Lewis M, Richer E., **Slavine NV**, Antich P. Development and Evaluation of an EMCCD based Gamma Camera, *IEEE Trans. on Nuclear Sci.*, **54**(5), pp. 1516-1524, 2007.
18. **Slavine NV**, Soesbe T., Lewis M, Richer E., Antich P. , Construction, calibration and evaluation of a tissue phantom with reproducible optical properties for investigation in Light Emission Tomography, *IEEE Workshop on Engineering in Medicine and Biology (EMB)*, Dallas, **1**, pp. 122-125, 2007.
19. Jennewein M, Lewis M., Dawen Zhao, Tsyganov E, **Slavine NV**, Jin He, Watkins L., Kodibagkar V., O'Kelly S., Kulkarni P., Antich P, Hermanne A., Roesch F., Mason RP, Thorpe P, Vascular imaging of solid tumors in rats with a radioactive Arsenic-labeled antibody that binds exposed phosphatidylserine, *Clinical Cancer Research*, **14**(5), pp.1377-1385, 2008.

20. **Slavine NV**, Antich PP, Practical Method for radioactivity distribution analysis in Small-Animal PET cancer studies, Applied Radiation & Isotopes, **66**, pp. 1861-1869, 2008
- 21 **Slavine NV**, McColl RW, Richer E, Mason RP, Antich, PP, An Automated 3D Image- Processing Strategy for Small-animal Bioluminescence Cancer Studies, Proc. of 5<sup>th</sup> Biotechnology and Bioinformatics Symposium (BIOT), **1**, pp. 97-102, Arlington, Texas, 2008
22. Soesbe T., Lewis M., **Slavine NV**, Richer E., Bonte F., Antich P., High-Resolution Photon Counting Using a Lens-Coupled EMCCD Gamma Camera, IEEE Trans on Nuclear Science, **57**(3), pp. 1-8, 2010
23. Kulkarni P., Vasdev N., V.Arora, G.Hao, M.Long, **N.Slavine**, B.Qu, X.Sun, M.Bennet, P.Antich and F.Bonte, PET Imaging of Alzheimer's Disease (AD) Transgenic Mice with F-18 Labeled 8-hydroxy Quinoline, J. Alzheimer's & Dementia, 6(4), p.6, 2010.
24. Kulkarni P., N.Vasdev, , G.Hao, V.Arora, M.Long, **N.Slavine**, S. Chiguru, B.Qu, X.Sun, M.Bennet, P.Antich and F.Bonte, F-18 Labeled PET Agents for Imaging Alzheimer's Plaques, Nucl Instruments & Methods, In press, 2011.
25. Vasdev N., Cao P., Oosten E., Wilson A., Houle S., Hao G., **Slavine NV**, Antich P., Bonte F., Kulkarni P., Synthesis and preliminary PET imaging studies of F-18 flouroquinolin-8-ol in transgenic mouse models of Alzheimer's Disease, Medicin Chemistry Communications (MedChemComm), DOI:10.1039, in press, 2011.

## Conferences

1. Antich P., Ranney D., Kulkarni P., Constantinescu A., Fernando D., Mason R., Tsyganov E, Oz O., McColl R., **Slavine NV**, Parkey R.," Positron Imaging of Tumor angiogenesis using the biomarker Ga-68 deferoxamine-dermatan sulfate ", P-8, Soc. of Nuclear Imaging in Drug Develop, Bethesda, 2000.
- 2.Antich P., Parkey R., **Slavine NV**, Tsyganov E., Zinchenko A., Compact Compton Camera Design: Parameters and Imaging Algorithm, IEEE Nuclear Science Symposium & MIC-2000, Conference Record, Paper N225, Oktober 14-20, 2000, Lyon, France.
- 3.Antich P., **Slavine NV**, Tsyganov E. PET/SPECT Detectors with Light Intensifiers and Fiber Coding, IEEE Nuclear Science Symposium & MIC-2001, Conference Record, Paper, M13A-3,November 4-10,2001, San Diego, USA
- 4.Antich P., Ranney D., Kulkarni P., Constantinescu A., Fernando D., Mason R., Tsyganov E, Oz O., McColl R., **Slavine NV**, Parkey R.,"Positron Imaging of Tumor Angiogenesis using the Tumor Biomarker, Ga-68: Deferoxamine-Dermatan Sulfate [Ga:DF-DS], 48<sup>th</sup> Annual Meeting of the Society of Nuclear Medicine, Toronto, Ontario, Canada June, 23-27, 2001
5. Tsyganov E., Antich P., Buzulutskov A., Moore J., Parkey R., Selionine S., **Slavine NV**, Richer E., Nguen T, "Triple GEM structure for Medical Imaging", IEEE Nuclear Sci. Symp. and. Med. Imaging Conf. , Conf. Record, Norfolk, VA, 2002.
- 6.Tsyganov E., Antich P., Parkey R., Selionine S., **Slavine NV**, Soesbe T., Micro-SPECT Using NaI(Tl) Crystals , IEEE Nuclear Science Symposium & MIC-2003, Conference Record, Paper, M3-31, p.87, USA, 2003
7. Lewis M., Arbique G., Richer E., **Slavine NV**, Jennewien, Constantinescu A., Brekken R., Tsyganov E., Mason R., Antich P.,"Projection and Pinhole based Data Acquisition for Small

Animal SPECT using Storage Phosphor Technology, Workshop on Small animal SPECT, chapter 26, Arizona, Tucson, January 2004

8. Tsyganov E., Zinchenko A., **Slavine NV**, Selionine S, Parkey R, Antich PP, "Reconstruction Algorithm with Resolution for 3D Image in a Small Animal PET Imager, Workshop on Small animal SPECT, chapter 10, Arizona, Tucson, January 2004

9. Richer E., **Slavine NV**, Lewis M., Tsyganov E., Gellert G., Dikmen Z, Bhagwandin V., Shay J., Mason R., Antich P., "Three Dimensional Light Emission Tomography using Multiple Rotating CCD Camera", Third Annual Meeting, the Society for Molecular Imaging St. Louis, September, 2004

10. Jennewein M., Constantinescu A., Bergner O., Selionine S, **Slavine NV**, Lewis M., Zhao D O'Kelly S., Maus S., Qaim S., Tsyganov E., Antich P., Schirmacher R., Thrope P., Roesch F., Mason R, "Radioactive Arsenic Isotopes: New Tools for the Imaging of Tumor Targeting Antibodies", Academy of Molecular Imaging, Orlando, 2004..

11. Jennewein M., Constantinescu A., Bergner O., Lewis M., Zhao D., Selionine S, **Slavine NV**, O'Kelly S., Maus S., Qaim S., Tsyganov E., Antich P., Rosch F., Mason R., Thrope P., "Molecular Imaging of the Vascular Targeting Antibody Vatumab<sup>®</sup> in Rat Prostate Cancer", Annual Congress of the European Ass. of Nucl. Medicine, 4-8 September, Helsinki, Finland, 2004.

12. Bhagwandin VJ, Harper A., Beck AW, Mason RP, Richer E, Antich AA, Tsyganov E, Lewis MA, **Slavine NV**, Fleming JB, Wright WE, Brekken RA, Shay JW, "Detection of Pancreatic Cancer in Vivo using Light Emission Tomography", Proc. 13<sup>th</sup> Conf. of the Int. Society of Differentiation, Honolulu, 2005.

13. Mason R., Richer E., **Slavine NV**, Lewis M., Tsyganov E., Gellert G., Dikmen Z, Bhagwandin V., Shay J., Antich P. "Light Emission Tomography: visualizing bioluminescence in whole living mice in 3 D", Biophysical Society 49<sup>th</sup> Annual Meeting, California, February, 2005

14. Jennewein M., **Slavine NV**, Selionine S, Lewis M., Zhao D., O'Kelly S., Qaim S., Tsyganov E., Antich P., Rosch F., Mason R., Thrope P., "Molecular Imaging of the Vascular Targeting Antibody Tarvacin<sup>TM</sup> using a new Labeling Technique with Radioactive Arsenic Isotopes", 96<sup>th</sup> AACR (American Association for Cancer Research) Annual Meeting, Anaheim, California, April 2005.

15. Mai Lin, Wang Zh., Kodibagkar V., **Slavine NV**, Tsyganov E., Harper A., Chaney C., Hsieh J., Xiankai Sun, "Multimodality Imaging studies of Bone Metastasis in an Intraosseous Prostate Cancer Xenograft Mouse Model", 52<sup>h</sup> Annual Meeting Soc of Nuclear Medicine, Canada, Toronto, June, 2005.

16. Dawen Zhao, Harper A., Richer E., Li Lui, **Slavine NV**, Shay J., Antich PP, Mason RP, "Novel Application of Bioluminescent Imaging: Interrogating Acute Effects of the Vascular Targeting Agent Combretastatin", The Tumor Microenvironment: Hypoxia, Angiogenesis & Vasculature, 9<sup>th</sup> International Workshop, Oxford, England, 2005

17. **Slavine NV**, Lewis M., Richer E., Soesbe T., Antich PP, "Monte Carlo simulations of the 3D Reconstruction Capabilities of a Multi-Pinhole SPECT System", Workshop on Small animal SPECT, Arizona, Tucson, March 8-10, 2006

18. Lewis M., **Slavine NV**, Soesbe T., Richer E., Antich P., "Scatter and Absorption Correction for Low-Energy Small Animal SPECT using Optical Surface Topography in Dual-Modality Imaging System", Workshop on Small animal SPECT, Arizona, Tucson, March 8-10, 2006.

19. Zhao, D., Richer, E., Liu, Li., Ya Ren, **Slavine, NV**, Shay, J. W., Antich, P. P., Mason, R. "In vivo monitoring of antivasular effects of Combretastatin A4 Phosphate in a Breast Cancer Xenograft Model", 97th AACR, Washington, DC, April, 2006.

20. Richer, E., **Slavine, NV**, Kodibagkar V., Zhao, D., Lewis M., Mason, R., Antich, P. P., "In vivo comparison of Light Emission Tomography with MRI in Lung Metastasis Model", The 5<sup>th</sup> Annual Meeting, the Society for Molecular Imaging, Hawaii, September, 2006.

21. **Slavine NV**, Soesbe T., Lewis M, Richer E., Antich P. , Construction, calibration and evaluation of a tissue phantom with reproducible optical properties for investigation in Light Emission Tomography, IEEE Workshop on Engineering in Medicine and Biology, Dallas, November 11-12, 2007.

22. **Slavine NV**, Antich P.," Practical Method for radioactivity distribution analysis in Small-Animal PET/SPECT Cancer Studies", Workshop on Small-Animal SPECT, Arizona, Tucson, January 16-18, 2008.

23. Dawen Zhao, Karen Chang, Richer E, **Slavine NV**, Antich PP, Mason R, "Dynamic *In Vivo* Imaging of Breast Tumors Enhances Therapeutic Response to Combretastatin A4 Phosphate", Breast Cancer Research Meeting, Baltimore, Maryland, June 25-28, P9-6 p.51, 2008.

24. **Slavine NV**, McColl RW, Richer E, Mason RP, Antich PP, "An Automated 3D Image-Processing Strategy for Small-animal Bioluminescence Cancer Studies", Biotechnology and Bioinformatics Symposium (BIOT), Arlington, Texas, October 17-18, 2008.

25. **Slavine NV**, Antich PP., A Method for Improving the Quantitative Accuracy of Image Reconstruction in Small-Animal PET Cancer Studies, World Molecular Imaging Congress, Montreal, Canada, September 23-26, 2009

26. Kulkarni PV, Vasdev N, Arora V, Hao G, Long M, **Slavine NV**, Qi B, Sun X, Antich PP, Bonte FJ, PET Imaging of Alzheimer's Disease (AD) Transgenic Mice with F-18 labeled hydroxyquinoline Derivative, Conf. Soc of Nuclear Medicine, Salt Lake City, June 2010

27. Kulkarni PV, Arora V, Chiguru S, Hao G, Gupta A, **Slavine NV**, Qi B, Vasdev N, Sun X, Bennett M., Antich P., Bonte F., PET imaging of AD transgenic mice at early age with F-18 Quinoline, International Alzheimer's Disease Conference (AAIC-2011), 16-21 July, Paris, France, 2011

28. **Slavine NV.**, Kulkarni P., McColl R, et al, Improved Quantitative Accuracy for Early Diagnosis of Plaque Deposition in Alzheimer's Disease in Transgenic Mice, International Alzheimer's Disease Conference (AAIC-2011), 16-21 July, Paris, France, 2011

### **Ongoing Research Support**

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Mason (PI)

04/07-03/12

UT Southwestern Small Animal Imaging Resource

U24CA126608A – NIH/National Cancer Institute

This small animal imaging resource program grant will provide centralized coordination and integration of expertise and imaging infra-structure to enhance support of small animal imaging associated with all NCI sponsored grants on the campus of UT Southwestern.

**Role:** Co-Investigator, Responsibility for the automation of 3D volumetric bioluminescence processing: theoretical approaches and software development.