

## **Biographical Sketch**

### **Vladimir Gudkov**

Professor, Department of Physics and Astronomy, University of South Carolina, Columbia, South Carolina 29208, [gudkov@sc.edu](mailto:gudkov@sc.edu), (803)-576-5573

### **Professional Preparation**

Leningrad State University, USSR.	Physics (Nuclear Physics)	M.S., 1977
Leningrad Nuclear Physics Institute, USSR.	Theoretical Nuclear Physics	Ph.D., 1984

### **Appointments**

Jan. 2009 – present	Professor, University of South Carolina, SC.
Aug. 2003 – present	Distinguished Visiting Scientist, Oak Ridge National Laboratory, Oak Ridge, TN.
April 2004 – present	Member of Interdisciplinary Mathematical Institute, University of South Carolina, SC.
Aug. 2004 – 2008	Associate Professor, University of South Carolina, SC.
Apr. 1997 - 2004	Research Professor, University of South Carolina, SC.
1992 - 1997	Research Fellow, University of Melbourne, Australia.
1990 - 1992	Monbusho Fellow, National Laboratory for High Energy Physics (KEK), Japan
1979 - 1990	Staff Member, Theoretical Division and Division of Neutron Physics, Leningrad Nuclear Physics Institute, USSR.
1977 - 1979	Engineer-Physicist, Nuclear Industry (Navoi Mining Combine) USSR.

### **Selected Publications**

1. V.V. Nesvizhevsky, V. Gudkov, K.V. Protasov, W.M. Snow and A.Yu. Voronin, “Experimental Approach to Search for Free Neutron-Antineutron oscillations Based on Coherent Neutron and Antineutron Mirror Reflection”, PRL 122, 221802 (2019).
2. V. Gudkov and H. M. Shimizu, “Nuclear spin dependence of time reversal invariance violating effects in neutron scattering”, Phys. Rev. C 97, 065502 (2018).
3. V. Gudkov and H. M. Shimizu, “Pseudomagnetic effects for resonance neutrons in the search for time reversal invariance violation”, Phys. Rev. C 95, 045501 (2017).
4. S. Inoue, V. Gudkov, M. R. Schindler, and Y.-H. Song, “Screening of Nucleon Electric Dipole Moments in Nuclei”, Phys. Rev. C 93, 055501 (2016).
5. J. David Bowman and Vladimir Gudkov, “Search for Time Reversal Invariance Violation in Neutron Transmission”, Phys. Rev. C 90, 065503 (2014).
6. Y.-H. Song, R. Lazauskas and V. Gudkov, “Nuclear electric dipole moment of three-body systems”, Phys. Rev. C 87, 015501 (2013).
7. V. Gudkov, H. M. Shimizu and G. L. Greene, “Parametric resonance enhancement in neutron interferometry and application for the search for non-Newtonian gravity”, Phys. Rev. C 83, 025501 (2011).
8. V. Gudkov, V. Montealegre, S. Nussinov, Z. Nussinov “Community Detection in Complex

- Networks by Dynamical Simplex Evolution”, Phys. Rev. E78, 016113 (2008).
9. V. Gudkov and V. Montealegre, “Analysis of network by generalized mutual Entropies”, Physica A 387, 2620 (2008).
  10. S. Nakamura, T. Sato, V. Gudkov and K. Kubodera, “Neutrino Reactions on Deuteron,” Phys.Rev. C 63, 034617 (2001).
  11. V. P. Gudkov "On CP-violation in nuclear reactions" Phys. Rep. 212 (1992) 77.

### **Synergistic Activities**

The investigator is working in theory of weak interactions in low energy physics and, in particular, in fundamental neutron physics. He has a broad working knowledge in theory of nuclear reactions, nuclear fission theory, neutron physics, neutrino physics, hadron and quark physics, weak interactions and symmetries in nuclear and particle physics, and extensions of the Standard Model. Some of his results in this field include: the prediction of very large nuclear enhancement factors (about  $10^6$ ) for Time Reversal Invariance Violation (TRIV) effects in nuclear reactions; the possibility to avoid interfering effects for TRIV due to final state interactions in neutron induced reactions, and the new mechanism for neutron electric dipole moment in Weinberg's model of spontaneous CP-violation. His publications related to fundamental neutron physics and weak interactions have been cited more than 600 times. He is a member of a number of international collaborations in Fundamental Neutron Physics at the SNS (ORNL) and J-SNS (J-PARC, Japan), and NOPTREX collaboration for search of TRIV in nuclear scattering. He also is working in interdisciplinary research applying methods of theoretical physics to study complex network systems.

### **Principal Collaborators**

J. D. Bowman - Oak Ridge National Laboratory  
G. L. Greene - University of Tennessee / Oak Ridge National Laboratory  
R. Lazauskas - Université Louis Pasteur, France  
V. V. Nesvizhevsky – ILL, France  
S. Nussinov - Tel-Aviv University, Israel  
Z. Nussinov - Washington University, St. Louis  
M. R. Schindler - University of South Carolina  
H. M. Shimizu – Nagoya University, Japan  
W. M. Snow - Indiana University, Bloomington  
Y.-H. Song- Institute for Basic Science, South Korea

### **Thesis Advisor:**

V. Montealegre –graduated in 2008.  
Total number of advised graduate students: 8.