LIST OF PUBLICATIONS – Prof. Volker E. Oberacker

last update: January 21, 2016

Refereed Journal Articles and Book Chapters


9. *Positron creation in collisions of very heavy nuclei*, B. Müller, V. Oberacker, J. Reinhardt, G. Soff and W. Greiner, Proc. 15th Int. Winter Meeting on Nuclear Physics, Bormio, Italy (1977), p.243-


36. Heavy-ion interaction potentials and static deformation effects in sub-barrier fusion, V.E. Oberacker, M.W. Katoot and W.T. Pinkston, Proc. 23rd Int. Winter Meeting on Nuclear Physics, Bormio, Italy (1985), Supplemento n.47, pp. 540-550


73. HFB theory for nuclei near the drip lines: the B-Spline/Galerkin lattice method, V.E. Oberacker, Viewgraphs of the RIA 2000 Workshop, Durham, NC, July 24-26, 2000; published by Argonne Nat. Lab, Michigan State Univ. and Triangle Universities, p. 363 - 370


95. *$^{64}$Ni+$^{64}$Ni fusion reaction calculated with the density-constrained time-dependent Hartree-Fock formalism*, A.S. Umar and V.E. Oberacker, Phys. Rev. C 77, 064605 (2008) [6 pages]


112. *Dynamic microscopic study of pre-equilibrium giant resonance excitation and fusion in the reactions \( ^{132}\text{Sn}+^{48}\text{Ca} \) and \( ^{124}\text{Sn}+^{40}\text{Ca} \)*, V.E. Oberacker, A.S. Umar, J.A. Maruhn, and P.-G. Reinhard, Phys. Rev. C 85, 034609 (2012) [8 pages].


**Books Edited**


**Invited Presentations at International Conferences and Workshops**


4. *Positron creation in collisions of very heavy nuclei*, B. Müller, V. Oberacker, J. Reinhardt, G. Soff and W. Greiner, 15th Int. Winter Meeting on Nuclear Physics, Bormio, Italy (1977)

5. *Coulomb fission of 238U*, V. Oberacker, G. Soff and W. Greiner, Int. Conf. on Resonances in Heavy Ion Reactions, Hvar, Yugoslavia (1977)

6. *Positron production in heavy-ion collisions*, B. Müller, V. Oberacker, J. Reinhardt, G. Soff, W. Greiner and J. Rafelski, Int. Conf. on Nuclear Structure, Tokyo, Japan (1977)

7. *Quantum electrodynamics of strong fields and its test in heavy ion molecular collisions*, B. Müller, V. Oberacker, J. Reinhardt, G. Soff, W. Greiner and J. Rafelski, Int. Symp. on Nuclear Collisions and their Microscopic Description, Bled, Yugoslavia (1977)


11. *Present status of Coulomb fission - theory and experiment*, V. Oberacker, presentation at 16th Int. Winter Meeting on Nuclear Physics, Bormio, Italy (1978)


15. *Theoretical study of fission dynamics by muon-induced fission*, V.E. Oberacker, presentation at Int. Conf. on Nuclear Physics, Berkeley, California (1980)

17. A study of fission dynamics by muon-induced fission, V.E. Oberacker, presentation at LAMPF II Workshop, Los Alamos, New Mexico (1982)


19. Heavy-ion potentials for strongly deformed nuclei, V.E. Oberacker, presentation at Int. Conf. on Fusion Reactions below the Coulomb barrier, Massachusetts Institute of Technology, Cambridge, MA (1984)


21. Influence of nuclear deformation and orientation on heavy-ion reactions near the Coulomb barrier, V.E. Oberacker, presentation at APS Division of Nuclear Physics Meeting, Vanderbilt University, Nashville, TN (1984)

22. Heavy-ion interaction potentials and static deformation effects in sub-barrier fusion, V.E. Oberacker, presentation at 23rd Int. Winter Meeting on Nuclear Physics, Bormio, Italy (1985)

23. Muon-induced fission, V.E. Oberacker, presentation at Int. Symposium on Nuclear Fission and Heavy-Ion Induced Reactions, Rochester, N.Y., April 20-22, 1986

24. Theories of heavy-ion interaction potentials for giant dinuclear systems, V.E. Oberacker, presentation at NATO Advanced Study Institutes Programme, Physics of Strong Fields, Maratea/Italy, June 1-14, 1986

25. Study of the consequences of hypothesized potential pockets using simple models, W.T. Pinkston, D.P. Russell and V.E. Oberacker, presentation at NATO Advanced Study Institutes Programme, Physics of Strong Fields, Maratea/Italy, June 1-14, 1986


27. Lepton Production in Relativistic Heavy-Ion Collisions, V.E. Oberacker, presentation at Holifield Theory Users Group Meeting, Oak Ridge, TN (Sept. 1987)

28. Lattice calculation of dilepton production in peripheral relativistic heavy-ion collisions, V.E. Oberacker, presentation at NATO Advanced Study Institute on The Nuclear Equation of State, Peniscola/Spain (21 May - 3 June, 1989)

29. Study of the Time-Dependent Dirac Equation on a 3-d collocation lattice, V.E. Oberacker, presentation at Holifield Theory Users Meeting, Oak Ridge, TN (March 1990)

30. Computational heavy-ion collider physics, V.E. Oberacker, presentation at Planning Meeting of the Oak Ridge DOE High-Performance Computing Program, New York City (Nov. 11-12, 1990)
31. Nonperturbative electromagnetic muon-pair production with capture in peripheral relativistic heavy-ion collisions, J.C. Wells (grad. student of Prof. Oberacker), presentation at Int. Conf. on Computational Quantum Physics, Vanderbilt University, Nashville, TN (May 23-25, 1991)


33. Nonperturbative lepton pair production in peripheral relativistic heavy-ion collisions, J.C. Wells, (grad. student of Prof. Oberacker), presentation at Workshop on “Emission and Absorption of Radiation by Structured Particles”, Institute for Theoretical Atomic and Molecular Physics, Harvard-Smithsonian Center for Astrophysics, (Oct 11-14, 1991)

34. Muon beams as a probe for nuclear fission dynamics – a 3-dim. simulation, V.E. Oberacker, invited poster presentation, Supercomputing 91, Albuquerque, NM (Nov. 1991)

35. Theoretical study of fission dynamics with muons, V. E. Oberacker, presentation at Int. Symposium on Nuclear Physics of Our Times, Sanibel Island (Nov. 17-21, 1992)


37. Perturbative and nonperturbative EM lepton pair production in relativistic heavy-ion collisions, V.E. Oberacker, presentation at NATO Advanced Study Institute on Hot and Dense Nuclear Matter, Bodrum / Turkey (26 Sep - 9 Oct 1993)

38. Recent progress in nonperturbative electromagnetic lepton-pair production with capture in relativistic heavy-ion collisions, J.C. Wells (grad. student of Prof. Oberacker), presentation at NATO Advanced Study Institute on Hot and Dense Nuclear Matter, Bodrum / Turkey, (26 Sep - 9 Oct 1993)


41. Parallel implementation of the Dirac equation in three cartesian dimensions, J.C. Wells (grad. student of Prof. Oberacker), presentation at 6th Joint EPS-APS International Conference on Physics Computing, Lugano, Switzerland, August 1994


45. Mean-field nuclear structure calculations in the Spline-Galerkin Lattice Representation, V.E. Oberacker, presentation at XXII Int. Workshop on Condensed Matter Theories, Vanderbilt University (June 1998)

46. Prompt muon-induced fission: a probe for nuclear energy dissipation, V.E. Oberacker, presentation at Int. Symposium on ”Nuclear Shapes and Motions” in honor of Ray Nix, Santa Fe, NM (Oct. 1998)

47. Mean-field nuclear structure calculations on a Basis-Spline-Galerkin lattice, V.E. Oberacker, presentation at Int. Conf. on Perspectives in Nuclear Physics, Nassau, Bahamas (Nov. 1998)

48. HFB theory for nuclei near the drip lines: the B-Spline/Galerkin lattice method, V.E. Oberacker, presentation at RIA 2000 Workshop, Durham, NC, July 24-26, 2000

49. HFB pairing coupling to the continuum on a 2-D lattice, V.E. Oberacker, Institute for Nuclear Theory program INT-00-3 on ”Nuclear Structure for the 21st Century”, Seattle, WA, October 15-21, 2000


52. HFB calculations near the drip lines, E. Teran, V.E. Oberacker, and A.S. Umar, IV Latin American Symposium on Nuclear Physics, Mexico City, September 24-28, 2001

53. Nuclear structure near the neutron dripline: lattice HFB calculations with high-energy continuum coupling, V.E. Oberacker, A.S. Umar, and E. Teran, JLAB Workshop, Physics Department, University of Georgia at Athens, Sep. 13, 2002


55. The Vanderbilt HFB-2D code and recent results, V.E. Oberacker, invited presentation at US-Japan Collaboration Workshop on Nuclear Structure Theory, Joint Institute for Heavy Ion Research, Oak Ridge National Laboratory, August 18-22, 2003


58. **HFB lattice calculations**, A.S. Umar and V.E. Oberacker, invited presentation at International Workshop on Theoretical Description of the Nuclear Large Amplitude Collective Motion, Joint Institute for Heavy Ion Research, Oak Ridge National Laboratory, March 17-19, 2004

59. **TDHF studies of neutron-rich systems**, A.S. Umar and V.E. Oberacker, 4th International Conference on Exotic Nuclei and Atomic Masses (ENAM04), Pine Mountain, Georgia (Sep. 2004), invited poster presentation


61. **HFB and TDHF calculations on the lattice: recent results**, V.E. Oberacker, invited presentation at US-Japan Collaboration Workshop on Nuclear Structure Theory, Joint Institute for Heavy Ion Research, Oak Ridge National Laboratory, Sept. 21-23, 2004

62. **TDHF fusion calculations**, A.S. Umar and V.E. Oberacker, invited presentation at International Workshop on Theoretical Description of the Nuclear Large Amplitude Collective Motion, Joint Institute for Heavy Ion Research, Oak Ridge National Laboratory, March 30-31, 2005

63. **3-D unrestricted TDHF fusion studies of neutron-rich nuclei using the full Skyrme interaction**, V.E. Oberacker and A.S. Umar, invited presentation at HRIBF Workshop on “Near and Sub-barrier Fusion of Radioactive Ions with Medium and Heavy Targets”, Oak Ridge National Laboratory, (Dec. 2-3, 2005); proceedings published on the Web: http://www.phy.ornl.gov/workshops/fusfis/talks/oberacker.pdf


65. **Nuclear Collective Dynamics and Density Constrained TDHF**, A.S. Umar and V.E. Oberacker, invited presentation at Joint JUSTIPEN-LACM Meeting, Oak Ridge National Laboratory, March 5-8, 2007


68. **Heavy-Ion Fusion / fission and TDHF**, A.S. Umar and V.E. Oberacker, invited presentation at 3rd LACM-EFES-JUSTIPEN Workshop, Oak Ridge National Laboratory, Feb. 23-25, 2009

70. *Multi-nucleon transfer as doorway to fusion of neutron-rich nuclei*, V.E. Oberacker and A.S. Umar, 8th Int. Conf. on Radioactive Nuclear Beams (RNB8), Grand Rapids, Michigan (May 2009); presentation published on conference CD.


75. *Microscopic Calculation of Heavy-Ion Potentials Based on TDHF*, A.S. Umar, V.E. Oberacker, J.A. Maruhn, and P.-G. Reinhard, invited presentation at “FUSION11” International Conference on Reaction Mechanisms and Nuclear structure around the Coulomb Barrier, May 2-6, 2011 - Saint Malo, France

76. *Static and Dynamic Cluster Structure in the Mean-Field Theory*, J. A. Maruhn, A. S. Umar, N. Itagaki, N. Loebl, V. E. Oberacker, and M. Kimura, invited presentation at “FUSION11” International Conference on Reaction Mechanisms and Nuclear structure around the Coulomb Barrier, May 2-6, 2011 - Saint Malo, France


82. Microscopic calculation of fusion; light to heavy systems, A.S. Umar, V.E. Oberacker, J.A. Maruhn, and R. Keser, Fifth Int. Conf. on Fission and Properties of Neutron-Rich Nuclei, Sanibel Island, FL (Nov. 4-10, 2012)


84. Fusion of neutron-rich nuclei using a Time-Dependent Density Functional Theory with density constraint, V.E. Oberacker and A.S. Umar, invited talk at the 246th American Chemical Society Meeting in Indianapolis (Sept. 8-12, 2013), Division of Nuclear Chemistry and Technology, Symposium on Nuclear Reactions

85. Determining the total fusion cross-section for $^{19,20}$O + $^{12}$C near and below the Coulomb barrier, R.T. deSouza, S. Hudan, K. Brown, T. Steinbach, A. Chbihi, M. Famiano, J.F. Liang, V. Oberacker, and S. Umar, invited talk at the 246th American Chemical Society Meeting in Indianapolis (Sept. 8-12, 2013), Division of Nuclear Chemistry and Technology, Symposium on Nuclear Reactions

86. Fusion and other applications of density-constrained TDDFT, V.E. Oberacker and A.S. Umar, invited talk (50 min) at the INT 13-3 Program on “Quantitative Large Amplitude Shape Dynamics: fission & heavy ion fusion”, Institute for Nuclear Theory, Seattle, WA (Oct. 6-12, 2013). Talk posted on INT Website http://www.int.washington.edu/talks/WorkShops/int_13_3/

87. Density-constrained TDDFT with application to fission, A.S. Umar and V.E. Oberacker, invited talk (50 min) at the INT 13-3 Program on “Quantitative Large Amplitude Shape Dynamics: fission & heavy ion fusion”, Institute for Nuclear Theory, Seattle, WA (Oct. 6-12, 2013). Talk posted on INT Website http://www.int.washington.edu/talks/WorkShops/int_13_3/


Conference Abstracts


78. Dynamics of Quasifission and Fission, Sait Umar and Volker Oberacker, Super Heavy Nu-
cleis(SHE2015) Symposium, Texas A & M University, College Station TX, (March 31 - April 3, 2015), book of abstracts pp. 31


80. Measuring the Fusion Cross-Section of $^{18,19}$O+$^{12}$C with Low-Intensity Beams at Energies Near and Below the Coulomb Barrier, Steinbach, Tracy; Vadas, Justin; Schmidt, Jon; Singh, Varinderjit; Hudan, Sylvie; Desouza, Romnaldo; Baby, Lagy; Kuvin, Sean; Wiedenhover, Ingo; Umar, Sait; Oberacker, Volker, APS April Meeting 2015, abstract X4.003

Colloquia and Seminars given at other institutions (partial list)

1. Coulomb fission: theory and experiment, Nuclear physics seminar at Wright Nuclear Structure Laboratory, Yale University, V.E. Oberacker, Visiting Research Associate (Feb. 1977)

2. Coulomb and muon-induced fission, V.E. Oberacker, Nuclear physics seminar at Wright Nuclear Structure Laboratory, Yale University (Nov. 1979)

3. Atomic and nuclear physics with heavy ions: decay of the vacuum, dinuclear systems and subbarrier fusion, V.E. Oberacker, colloquium given at Georgia Institute of Technology, School of Physics, Feb. 15, 1984

4. A microscopic approach to the calculation of heavy-ion potentials, Oak Ridge National Laboratory, V.E. Oberacker, Physics Division seminar, Aug. 9, 1984

5. Coulombspaltung: Theorie und Experiment, Universitaet Giessen, GERMANY, V.E. Oberacker, Theoretisches Seminar, June 7, 1985

6. Positron production in heavy-ion collisions and implications for nuclear heavy-ion potentials, Brookhaven National Laboratory, V.E. Oberacker, Nuclear Physics Seminar, Aug. 23, 1985


9. Theory of nonperturbative lepton pair production in ultrarelativistic heavy-ion collisions, Jack C. Wells (grad. student of Prof. Oberacker), ITAMP colloquium, Harvard-Smithsonian Center for Astrophysics, (November 1991),
10. Study of nuclear dissipation via prompt muon-induced fission, V.E. Oberacker, Theory Seminar, Physics Division, Oak Ridge National Laboratory, Sep. 18, 1992


12. Recent developments in muon-induced fission, V.E. Oberacker, Physics Division Seminar, Oak Ridge National Laboratory, Aug. 9, 1993

13. Basis-Spline collocation method in curvilinear coordinates with application to nuclear structure physics, V.E. Oberacker, presentation at Joint Institute for Heavy-Ion Research, Oak Ridge National Laboratory, July 25, 1995

14. The Spline-Galerkin method applied to deformed shell model and mean field theories, V.E. Oberacker, presentation at Joint Institute for Heavy-Ion Research, Oak Ridge National Laboratory, August 5, 1996

15. Nuclear mean field calculations in the Spline-Galerkin lattice representation, V.E. Oberacker, seminar presented at Institute of Theoretical Physics, University of Warsaw (Poland), March 11, 1999

16. Kernstrukturtheorie im Zusammenhang mit radioaktiven Ionenstrahl-Beschleunigern, V.E. Oberacker, Colloquium at Institute for Theoretical Physics, Goethe-Universität Frankfurt am Main, Germany, March 22, 1999

17. The B-Spline Galerkin and collocation method with application to HFB theory in coordinate space, V.E. Oberacker, lecture at Kyoto University, Nov. 25, 2003

18. 2-D HFB lattice calculations: status report, V.E. Oberacker, lecture at Kyoto University, Nov. 28, 2003

19. Fusion of neutron-rich nuclei using a Time-Dependent Density Functional Theory with density constraint, V.E. Oberacker, Nuclear Physics Seminar at Indiana University, Bloomington, IN, March 29, 2013

20. Fusion and Quasifission Using Time-Dependent Density Functional Theory, V.E. Oberacker, Nuclear Science Seminar, National Superconducting Cyclotron Laboratory at Michigan State University, April 23, 2014

Colloquia and Seminars given locally (partial list)

1. Many-particle quantum physics using the Galerkin - Basis Spline representation, V.E. Oberacker, Seminar presented at Vanderbilt Dept. of Computer Science, April 1, 1998


4. *Structure of exotic nuclei near the neutron dripline*, V.E. Oberacker, Nuclear and Particle Physics Seminar, Dept. Physics & Astronomy, Vanderbilt University, Sept. 27, 2004

5. *Computational nuclear structure and reaction theory: exotic neutron-rich nuclei*, V.E. Oberacker and A. S. Umar, Physics 300 graduate student seminar, Dept. Physics & Astronomy, Vanderbilt University, Sept. 6, 2005


**Conference Organizing Committees / Sessions Chaired**

1. Organizing Committee, Division of Nuclear Physics Meeting of the American Physical Society, Vanderbilt University (Oct. 1984)

2. Organizing Committee, Conference on Computational Quantum Physics, Vanderbilt University (May 23-25, 1991)

3. Organizing Committee, First Symposium on Nuclear Physics in the Universe, Oak Ridge National Laboratory (Sep. 24-26, 1992)

4. Organizing Committee, NATO Advanced Study Institute on Hot and Dense Nuclear Matter, Bodrum/Turkey (Sep. 26 - Oct. 9, 1993)

5. Organizing Committee, Student Physics Society Zone 8 Conference, Vanderbilt University, (March 29-30, 1996)

7. Session Chair, Int. Conference NUCLEAR STRUCTURE '98, Gatlinburg, TN (August 10-15, 1998)

8. Session Chair, International Conference on Physics with Radioactive Ion Beams (ISOL’01), Oak Ridge, TN (March 11-14, 2001)

9. Session Chair, HRIBF Workshop on “Near and Sub-barrier Fusion of Radioactive Ions with Medium and Heavy Targets”, Oak Ridge National Laboratory (Dec. 2-3, 2005)

10. Session Chair, International Conference on “Nuclear Structure ’06”, Oak Ridge, TN (July 24-28, 2006)

11. Organizing Committee, Division of Nuclear Physics Meeting of the American Physical Society, Nashville, TN (Oct. 2006)

12. Session Chair, Division of Nuclear Physics Meeting of the American Physical Society, Nashville, TN (Oct. 2006)

13. Session Chair, 2nd LACM-EFES-JUSTIPEN Workshop, Oak Ridge National Laboratory, Jan. 22-25, 2008

14. Session Chair, 3rd LACM-EFES-JUSTIPEN Workshop, Oak Ridge National Laboratory, Feb. 23-25, 2009

15. Member of the International Advisory Committee, 4-th International Conference on “Current Problems in Nuclear Physics and Atomic Energy (NPAE-Kyiv2012)”, Sep. 3-7, 2012 (Kiev, Ukraine).