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Curriculum Vitae

Ruprecht Machleidt

Personal Data

Professional Status	Professor of Physics
Field of Research	Theoretical Nuclear Physics
Institution	University of Idaho
Address	Department of Physics University of Idaho Moscow, Idaho 83844-0903 U. S. A.
Telephon	Office (208) 885-6380
E-mail	*machleid@uidaho.edu*
Personal Website	http://machleidt.weebly.com
Nationality	U.S. and German citizen

Research Interests

Theoretical nuclear physics; theory of nuclear forces, meson theory, chiral effective field theory; nucleon-nucleon (NN) scattering below and above the pion-production threshold; NN potentials, nuclear many-body forces, few-nucleon physics; ab initio approaches to nuclear structure and reactions; nuclear matter theory with relativity and subnuclear degrees of freedom.

Some Other Interests

Nuclear medicine, radiation therapies for the treatment of cancer, proton therapy; Greek philosophy and modern particle physics, the dream of a theory of everything through history; the Intelligent Design controversy, Science and Religion.

Main Research Accomplishments

- Meson theory of nuclear forces. The Bonn meson-exchange model for the nucleon-nucleon interaction, R. Machleidt, K. Holinde, and Ch. Elster, Physics Reports **149**, 1 (1987) [2763 citations according to Google Scholar]; R. Machleidt, The meson theory of nuclear forces and nuclear structure, Advances in Nuclear Physics **19**, 189 (1989) [1685 citations].
- The Dirac-Brueckner approach to nuclear matter. Major publications: R. Brockmann and R. Machleidt, Physics Letters B **149**, 283 (1984) [259 citations]; R. Brockmann and R. Machleidt, Physical Review C **42**, 1965 (1990) [691 citations].
- High-precision NN potentials ("CD-Bonn"). Major publications: R. Machleidt, F. Sammarruca, and Y. Song, Physical Review C **53**, 1483 (1996) [764 citations]; R. Machleidt, Physical Review C **63**, 024001 (2001) [1338 citations].
- Chiral effective field theory and nuclear forces. Major publications: D. R. Entem and R. Machleidt, Physical Review C **68**, 041001 (2003) [823 citations]; R. Machleidt and D. R. Entem, Physics Reports **503**, 1 (2011) [324 citations].
- Total of 147 publications in refereed journals plus 152 conference contributions; 13,497 citations and h-index of 44 according to Google Scholar.
- 62 invited talks and lectures during the past 10 years.

Educational Background

Ph.D., Physics, University of Bonn, Germany, 1973.
M.S., Physics, University of Bonn, Germany, 1971.

Professional Experience

Acting Chair, Department of Physics, University of Idaho, August 2003 - July 2006.

Professor of Physics (tenured), University of Idaho, since 1991.

Associate Professor of Physics, University of Idaho, 1988-91.

Adjunct Associate Professor of Physics, University of California at Los Angeles (UCLA), 1986-88.

Visiting Associate Research Physicist, Los Alamos Meson-Physics Facility (LAMPF), Los Alamos National Laboratory, Los Alamos, New Mexico, 1986-88.

Visiting Faculty Member, Virginia Polytechnic Institute and State University (VPI), Blacksburg, Virginia, Fall 1985.

Visiting Senior Scientist, Canada's National Meson-Physics Facility (TRIUMF), Vancouver, Canada, 1983-85.

Wissenschaftlicher Assistent ($\approx$ assistant professor/research associate), Institute for Theoretical Nuclear Physics, University of Bonn, Germany, 1978-83.

Postdoctoral Research Associate, State University of New York at Stony Brook, 1976-77.

Postdoctoral Research Associate, University of Bonn, Germany, 1974-75.

Professional Activities

Consultant

Los Alamos National Laboratory, Physics Division (P-15), Los Alamos, New Mexico, 1986-88.

Reviews for Funding Agencies

U.S. National Science Foundation (NSF),
Theoretical Physics Program,
Condensed Matter Theory Program.
U.S. Department of Energy (DOE).
San Diego Supercomputer Center.
Natural Science and Engineering Research Council of Canada (NSERC).
Australian Research Council (ARC).
Foundation for Research Development of South Africa.

Italian Department for Teaching and University Research (MIUR).
CINECA, Consortium of 54 Italian Universities.
Istituto Nazionale di Fisica Nucleare (INFN), Italy.
Fondo Nacional de Investigacion Cientifica y Tecnologica, Santiago, Chile.
FWF, Der Wissenschaftsfonds (Austrian Science Fund), Vienna, Austria.

Refereeing for Physics Journals

Physical Review C
Physical Review Letters
Reviews of Modern Physics
Nuclear Physics
Physics Letters
Journal of Physics G: Nuclear and Particle Physics
Few Body Systems
Jordan Journal of Physics
Turkish Journal of Physics
Scholarpedia

Awards, Memberships, Fellowships

Fellow, American Physical Society, since 2000.
University of Idaho Faculty Award for Research Excellence, 2001.
Vandal Pride Award, University of Idaho, 2002.
Distinguished Faculty Member, University of Idaho Chapter of the Honor Society of Phi Kappa Phi, since 2000.
Faculty Excellence Award, University of Idaho Alumni Association, 2000.
Faculty Excellence Award, Navy ROTC, University of Idaho, 1998.
Affiliate, Institute for Nuclear Theory (INT), University of Washington, Seattle, Washington.
Fellowship, Deutsche Forschungsgemeinschaft, 1983-85.
Postdoctoral Fellowship, Deutsche Forschungsgemeinschaft, 1976-77.

Funding

Nuclear Theory at the University of Idaho, DOE Office of Science, $285,000, PIs: F. Sammarruca and R. Machleidt, 08/2012-07/2015.

Nuclear Theory at the University of Idaho, DOE Office of Science, $230,000, PIs: F. Sammarruca and R. Machleidt, 08/2009-07/2012.

Chiral Symmetry and the Nucleon-Nucleon Interaction, NSF, Theoretical Physics Program, PI: R. Machleidt, $141,000; 5/2001-4/2007.

Relativistic Nuclear Few- and Many-Body Problems, NSF, Theoretical Physics Program, PI: R. Machleidt, $134,564; 5/1997-4/2001.

Relativistic Meson-Nuclear Physics, NSF, Theoretical Physics Program, PI: R. Machleidt, $87,800; 8/92-1/96.

Relativistic Nuclear Many-Body Physics, Idaho State Board of Education, PI: R. Machleidt, $30,000; 7/92-6/93.

A Critical Study of Meson-Theoretic Approaches to Nuclear Forces and Nuclear Structure, NSF, Idaho EPSCoR Program, PI: R. Machleidt, $70,918; 5/90-4/92.

Relativistic Nuclear Structure Physics, NATO, Scientific Affairs Division, Collaborative Research Program, $7,100; 3/89-7/92.

Relativistic Meson-Nuclear Physics, NSF, Theoretical Physics Program, PIs: P. A. Deutchman and R. Machleidt, $131,120; 9/89-2/93.

University of Idaho, Research Office, $7,440 for partial postdoctoral support, PI: R. Machleidt, 3/89-8/89.

University of Idaho, College of Letters and Science, $27,000; PI: R. Machleidt, 9/88-8/89.

Relativistic Nuclear Currents and Nucleon Electroproduction, NSF, United States – Federal Republik of Germany Cooperative Science Program, $8,600; 3/88-8/91.

Invited Talks, Lectures, Panel Discussions (since 1995)

Recent Advances in our Understanding of Nuclear Forces and Nuclear Structure, Colloquium, Department of Physics, Washington State University, Pullman, Washington, September 9, 2014.

The Theory of Nuclear Forces: Eight Decades of Struggle, Invited Talk, Kavli Institute for Theoretical Physics China, Bejing, P. R. of China, August 2014.

Nuclear Forces, Series of four Invited Lectures, Department of Physics, Peking University, Beijing, P. R. of China, August 2014.

Nuclear Forces, Series of six Invited Lectures, Department of Physics, Tohoku University, Sendai, Japan, June/July 2014.

Chiral EFT and nuclear forces: Are we in trouble?, R. Machleidt, Invited Talk, Workshop on Nuclear Theory in the Supercomputing Era - 2014, Khabarovsk, Russia, June 2014.

The explosion of chiral many-body forces: How to deal with it?, Invited Talk, 11th International Spring Seminar on Nuclear Physics, Ischia, Italy, May, 2014.

Why all that fuss about the Higgs Boson?, Invited Keynote Talk, 56-th Annual Meeting of the Idaho Academy of Science, Moscow, Idaho, March 21, 2014.

Klaus Erkelenz and the Bonn Potential, Colloqium, Symposium in Memory of Klaus Erkelenz, University of Bonn, Germany, November 15, 2013.

Nuclear Physics—a Blessing to Mankind: Recent Advances in Radiation Therapies for Cancer, Renfrew Interdisciplinary Colloquium, University of Idaho, September 10, 2013.

Nuclear Forces, Series of four Invited Lectures, 12th Center of Nuclear Studies (CNS) International Summer School, University of Tokyo, Tokyo, August 2013.

Nuclear theory at the University of Idaho, Presentation to International Panel appointed by the Department of Energy, Washington, D.C., June 2013.

In Memoriam Gerald E. Brown, presentation at ECT* Workshop From Few-Nucleon Forces to Many-Nucleon Structure, Trento, Italy, June 2013.

Chiral Effective Field Theory for Nuclear Forces: Achievements and Challenges, R. Machleidt, Invited Plenary Talk, International Nuclear Physics Conference, Florence, Italy, June 2013.

Origin and Properties of Strong Inter-Nucleon Interactions, R. Machleidt, Invited Keynote Talk, Workshop on Nuclear Theory in the Supercomputing Era - 2013, Iowa State University, Ames, Iowa, May 2013.

What holds the nucleus together?, R. Machleidt, Invited Talk, Society of Physics Students (SPS) Zone-17 Meeting, Washington State University, Pullman, Washington, April 6, 2013.

Chiral Effective Field Theory for Nuclear Forces: The Path to Nuclear Structure from First Princles, R. Machleidt, Invited Keynote Talk, Workshop on "Progress in Ab Initio Techniques in Nuclear Physics", TRIUMF, Vancouver, BC, Canada, February 2013.

Higgs Boson, Science on Tap, Coeur d'Alene, Idaho, January 8, 2013.

Teaching Intelligent Design: The Scientific, Theological, and Legal Controversy, R. Machleidt, Colloquium, Department of Physics, University of Idaho, December 2012.

Who needs a Higgs Boson? R. Machleidt, Colloquium, Department of Physics, University of Idaho, October 2012.

Nuclear Forces, R. Machleidt, Lecture Series, International Scientific Meeting on Nuclear Physics, La Rábida, Huelva (Spain), September 2012.

Recent Progress in the Theory of Nuclear Forces, R. Machleidt, Invited Plenary Talk, 20th International IUPAP Conference on Few-Body Problems in Physics, Fukuoka, Japan, August 2012.

Nuclear forces from chiral effective field theory: Achievements and challenges, R. Machleidt, Invited Talk, 31st International Workshop on Nuclear Theory, Rila Mountains, Bulgaria, June 2012.

Three-nucleon forces in chiral perturbation theory, R. Machleidt, Invited Plenary Talk, 2012 April Meeting of the American Physical Society, Atlanta, Georgia, April 2012.

Three-Nucleon Forces at N^3LO and Beyond, R. Machleidt, Invited Keynote Talk, Workshop on "Perspectives of the Ab Initio No-Core Shell Model", TRIUMF, Vancouver, BC, Canada, February, 2012.

Nuclear forces from chiral effective field theory: Achievements and challenges, R. Machleidt, Invited Keynote Talk, Fifth Asia-Pacific Conference on Few-Body Problems in Physics (APFB2011), Seoul, South Korea, August 2011.

Sub-leading three-nucleon forces in chiral perturbation theory, R. Machleidt, Invited Keynote Talk, International Workshop on Three-Nucleon Forces in Vacuum and in the Medium, European Center for Theoretical Studies in Nuclear Physics and Related Areas (ECT*), Trento, Italy, July 2011.

What holds the nucleus together?, R. Machleidt, Invited Talk, Society of Physics Students (SPS) Zone-17 Meeting, Vantage Wind Farm, Vantage, Washington, April 16, 2011.

The nuclear force problem: Have we finally reached the end of the tunnel?, R. Machleidt, Invited Talk, 474th WE-Heraeus-Seminar on "Strong Interactions: From Methods to Structures", Physikzentrum Bad Honnef (Germany), February 2011.

Have we finally cracked the nuclear force problem?, R. Machleidt, Invited Keynote Talk, International Workshop on the NN Interaction and the Nuclear Many-Body Problem, Tata Institute of Fundamental Research, Mumbai, India, November 2010.

Understanding the Atomic Nucleus: Recent Dramatic Advances and Remaining Challenges, R. Machleidt, Portuguese National Conference on Physics and Iberian Meeting on Physics Education, Vila Real, Portugal, September 2010.

Round table discussion of the nuclear force, Invited Member of the Panel, 21st European Conference on Few-Body Problems in Physics, Salamanca, Spain, August 2010.

Nuclear forces from chiral EFT: The unresolved issues, R. Machleidt, Invited Talk, 21st European Conference on Few-Body Problems in Physics, Salamanca, Spain, August 2010.

Nuclear forces from chiral EFT: The unfinished business, R. Machleidt, Invited Talk, 10th International Spring Seminar on Nuclear Physics, New Quests in Nuclear Structure, Vietri sul Mare, Italy, May 2010.

Nuclear Forces from Chiral EFT: The Unfinished Business, Theory Seminar, Jefferson Lab, Newport News, VA, April 2010.

Nuclear Physics a Blessing to Mankind: Recent Advances in Radiation Therapies for Cancer, R. Machleidt, Colloquium, Department of Physics, University of Idaho, September 2009.

Recent Advances in the Theory of Nuclear Forces and its Relevance for the Microscopic Approach to Dense Matter, Invited Talk, International Workshop on Nuclear Dynamics in Heavy Ion Reactions and the Symmetry Energy, Shanghai, China, August 2009.

The Missing Three-Nucleon Forces: Where Are They?, Invited Talk, 28th International Workshop on Nuclear Theory, Rila Mountains, Bulgaria, June 2009.

The Missing Three-Nucleon Forces: Where Are They?, Invited Talk, national Institute for Nuclear Theory (INT), University of Washington, Seattle, Washington, Program on 'Effective Field Theories and the Many-Body Problem', Spring 2009.

The Missing Three-Nucleon Forces: Where Are They?, Invited Talk, 2009 Mardi Gras "Special Symmetries and Ab Initio Methods for Light Nuclei" Workshop, Louisiana State University, February 2009.

Solving a Half-Century-Old Mystery: Why is There Carbon Dating? R. Machleidt, Colloquium, Department of Physics, University of Idaho, January 2009.

The Nuclear Force Problem: Is the Never-Ending Story Coming to an End?, Colloquium, Department of Physics, The University of Arizona, Tucson, Arizona, November 7, 2008.

Chiral Three-Nucleon Forces Beyond Next-to-Next-to-Leading Order, Particle and Nuclear Theory Seminar, Department of Physics, The University of Arizona, Tucson, Arizona, November 6, 2008.

Nuclear Two- and Many-Body Forces from Chiral EFT: Current Status and Open Issues, Invited Talk, 410. WE-Heraeus Seminar, Ab-Initio Nuclear Structure—Where Do We Stand?, Bad Honnef, Germany, July 2008.

Solving a Five Decade-Old Mystery: Why is There Carbon Dating?, Invited Talk, Tenth Annual Meeting of the Northwest Section of the American Physical Socienty, Portland, Oregon, May 2008.

Nucleon-Nucleon Interactions from Effective Field Theories, Invited Talk, From Quarks to the Nuclear Many-Body Problem, A Conference on Recent Advances in Nuclear Many-Body Physics, Oslo, Norway, May 2008.

Nuclear Two- and Many-Body Forces from Chiral EFT: Current Status and Open Issues, Invited Talk, national Institute for Nuclear Theory (INT), University of Washington, Seattle, Washington, Program on 'Nuclear Many-Body Approaches for the 21th Century', Fall 2007.

Recent Advances in the Theory of Nuclear Forces and Its Impact on Microscopic Nuclear Structure, Invited Talk, International Symposium on Exotic States of Nuclear Matter, Catania, Italy, June 2007.

NN and NNN Interactions, Invited Contribution, 2007 Town Meeting for NSAC Long Range Plan, Chicago, January 2007.

Is Intelligent Design Science or Religion? Scientific, Theological and Legal Arguments in the Dover School Board Trial, R. Machleidt, Colloquium, Department of Physics, University of Idaho, December 2006.

Nuclear Forces, Series of four invited lectures, DAE-BRNS Workshop on Physics and Astrophysics of Hadrons and Hadronic Matter, Visva Bharati University, Shantiniketan, West Bengal, India, November 2006.

NN and Many-Body Interactions: Chiral Perturbation Theory, Effective Interactions, Invited Review Talk, SURA Workshop on the Physics of Nucleons and Nuclei, Washington, DC, October 2006.

The Theory of Nuclear Forces: Is the Never-Ending Story Coming to an End?, Invited Plenary Talk, 18th International IUPAP Conference on Few-Body Problems in Physics, Santos, S. Paulo, Brazil, August 2006.

Nuclear Forces from Effective Field Theory: A New Era in Microscopic Nuclear Structure, Invited Talk, Nuclear Structure '06, Conference on Nuclei at the Limits, Oak Ridge National Laboratory, Oak Ridge, Tennessee, July 2006.

The Nuclear Force Problem: Is the Never-Ending Story Coming to an End?, Invited Talk, 25th International Workshop on Nuclear Theory, Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences, Rila Mountains, Bulgaria, June 2006.

The nuclear force problem: Is the never-ending story coming to an end? R. Machleidt, Colloquium, Department of Physics, Washington State University, February 2006.

The history of the nuclear force: A long story of hope, error and desperation that finally is coming to a good end, R. Machleidt, Colloquium, Department of Physics, University of Idaho, December 2005.

The Nuclear Force Problem: Is the Never-Ending Story Coming to an End?, Colloquium, Argonne National Laboratory, Argonne, Illinois, November 2005.

The never-ending dream of mankind: The theory of everything, R. Machleidt, University Interdisciplinary Colloquium, University of Idaho, October 2005.

Have We Finally Cracked the Nuclear Force Problem?, Colloquium, TRIUMF, Canada's National Laboratory for Particle and Nuclear Physics, Vancouver, Canada, September 2005.

Nuclear Forces, Series of four invited lectures, 4th International Summer School of the Center for Nuclear Study (CNS), Tokyo, Japan, August 2005.

From the Deuteron to the TeV Region: How Well Do We Know the Nucleon-Nucleon Interaction? Invited Talk, International Workshop "Nuclear Forces and QCD: Never the Twain Shall Meet?", European Center for Theoretical Studies in Nuclear Physics and Related Areas (ECT*), Trento, Italy, June 2005.

Recent Advances in the Theory of Nuclear Forces, Invited Talk, International Symposium on Correlation Dynamics in Nuclei—on the occasion of the 50th anniversary of the Configuration Mixing theory of Arima and Horie, Tokyo, Japan, Jan 31 - Feb 4, 2005.

Towards a Consistent Approach to Nuclear Structure: EFT of Two- and Many-Body Forces, Invited Talk, national Institute for Nuclear Theory (INT), Workshop on 'Nuclear Forces and the Quantum Many-Body Problem', University of Washington, Seattle, Washington, October, 2004.

The Nucleon-Nucleon Interaction at Intermediate Energies, Invited Talk, Caucasian-German School and Workshop on Hadron Physics, Georgian Academy of Science and the Tbilisi State University, Tbilisi, Georgia, August/September 2004.

The Never-Ending Dream of Mankind: The Theory of Everything, After-Dinner Talk, North-West Section Meeting of The American Physical Society, Washington State University, Pullman, Washington, May 2004.

Uses of Nuclear Physics in Medicine, Invited Lecture for the 'Lecture Series in the Sciences', The University of Southern Mississippi, College of Science and Technology and the Hattiesburg Clinic, Hattiesburg, Mississippi, March 2004.

Some Issues Concerning the NN Interaction Based Upon Chiral Effective Field Theory, Invited Talk, Program on Theories of Nuclear Forces and Nuclear Systems, Institute for Nuclear Theory, University of Washington, Seattle, Washington, November 2003.

Nuclear Physics: A Blessing to Mankind, R. Machleidt, Colloquium, Department of Physics, Washington Sate University, September 2003.

Effective Field Theory and the Nucleon-Nucleon Interaction, R. Machleidt, Colloquium, Department of Physics, University of Naples, Naples, Italy, July 2003.

Recent Progress on Chiral NN Potentials, Invited Talk, International Workshop on Recent Advances in the Nuclear Shell Model, European Center for Theoretical Studies in Nuclear Physics and Related Areas (ECT*), Trento, Italy, July 2003.

Recent Progress on Chiral NN Potentials, Invited Talk, Worshop on Chiral Dynamics of Hadrons and Hadrons in the Medium, University of Valencia, Valencia, Spain, June 2003.

The nuclear force problem: Are we seeing the end of the tunnel?, Invited Lead Talk, 17-th Intern. IUPAP Conf. on Few-Body Problems in Physics, Duke University, Durham, North Carolina, June 2003.

Nuclear physics: A Blessing to Mankind, R. Machleidt, Colloquium, Department of Physics, University of Idaho, February 2003.

Chiral Symmetry and the Nucleon-Nucleon Interaction: Recent Progress, Invited Plenary Talk, April Meeting of the American Physical Society, Albuquerque, NM, April 2002.

Accurate NN potential based upon chiral perturbation theory, Invited Talk, ECT* Workshop: Current Theoretical and Experimental Investigations of the Nuclear Many-Body Problem and Applications, Trento, Italy, September 2001.

Developing an accurate NN potential based upon chiral perturbation theory, Invited Talk, INT Workshop on Theories of Nuclear Forces and Few-Nucleon Systems, Seattle, WA, June 2001.

Chiral symmetry and the nucleon-nucleon interaction: developing an accurate NN potential based upon chiral effective field theory, Invited Talk, 7-th Int. Spring Seminar on Nuclear Structure Physics "Challenges of Nuclear Structure", Maiori (near Naples), Italy, May 2001.

Light-front studies of nuclear correlations, Invited Talk, CEBAF/INT Workshop "Correlations in Nucleons and Nuclei", University of Washington, Seattle, March 2001.

Nucleon-nucleon potentials, Invited Talk, INT Program "Nuclear Structure for the 21st Century", University of Washington, Seattle, October 2000.

The nuclear force in the third millennium, Invited Talk, XVIIth European Conference on Few-Body Problems in Physics, Evora, Portugal, September 2000.

Nucleon-nucleon potentials, Invited Talk, 2000 Gordon Research Conference on Photonuclear Reactions, Tilton School, Tilton, New Hampshire, August 2000.

The nuclear force in the third millennium after Jesus Christ: a preview, Invited Talk, Workshop on The Nuclear Standard Model: Ieri, Oggi, Domani; Elba International Physics Center, Elba, Italy, June 2000.

Brueckner theory of nuclear matter with nonnucleonic degrees of freedom and relativity, Invited Talk, 10th International Conference on Recent Progress in Many-Body Theories, Seattle, Washington, USA, September 1999.

The charge-dependent Bonn NN potential, Invited Talk, ECT* Workshop: The Nuclear Interaction: Modern Developments, Trento, Italy, July 1999.

Current status of the NN potential market: a critical analysis, Invited Talk, Symposium on Current Topics in the Field of Light Nuclei, Cracow, Poland, June 1999.

How sensitive are various NN observables to changes in the πNN coupling constant?, Invited Talk, Workshop on Critical Points in the Determination of the Pion-Nucleon Coupling Constant, Uppsala, Sweden, June 1999.

The NN interaction from the deuteron to the TeV region: a consistent model, Invited Talk, 2nd Int. Workshop on the Nucleon-Nucleon Interaction, Bad Honnef, Germany, May 1999.

The Nucleon-Nucleon Interaction, Series of five Lectures presented at the Departament d'Estructura i Constituents de la Materia, Universitat de Barcelona, Spain, December 1998.

The nucleon-nucleon interaction at intermediate energies, Invited Talk, International Workshop on Intermediate Energy Spin Physics, Jülich, Germany, November 1998.

Open questions concerning the NN interaction at moderate energies, Invited Talk, IUCF Workshop on Few-Nucleon Physics with Stored, Cooled Beams, Bloomington, Indiana, September 1998.

Nuclear forces and nuclear structure, Invited Talk, Nuclear Structure '98, International conference on nuclear structure physics, Gatlinburg, Tennessee, August 1998.

Nuclear forces and nuclear structure, Invited Talk, 6th International Spring Seminar on Nuclear Physics, Highlights of Modern Nuclear Structure, S. Agata sui due Golfi, near Naples, Italy, May 1998.

Nuclear Forces and Nuclear Structure, Invited Talk, XX Brazilian Workshop on Nuclear Physics, Guaratingueta, Sao Paulo, Brazil, September 1997.

Nuclear Forces and Nuclear Structure, Invited Talk, International Workshop on Microscopic Many-Body Methods, ECT*, European Centre for Theoretical Studies in Nuclear Physics and Related Areas, Trento, Italy, June 1997.

Nucleon-Nucleon Scattering at Intermediate Energies: What Can We Learn?, Invited Keynote Talk, Annual COSY Meeting, Bad Honnef, Germany, 1996.

Nucleon-Nucleon Interactions, Lecture Series, Nuclear Physics Summer School, sponsored by the NSF and DOE, organized by the INT (University of Wahington), Pack Forest, Washington, June 1996.

Chiral Symmetry and the Nucleon-Nucleon Interaction, Invited Talk, XIII Int. Seminar on High Energy Physics Problems, Joint Institute for Nuclear Research, Dubna, Russia, 1996.

Off-Shell NN Potential and Nuclear Binding, Invited Talk, Mesons and Light Nuclei 1995, Straz pod Ralskem, Czech Republic, 1995.

How Well Do We Know the Nuclear Force after 50 Years of Research?, Invited Overview Talk, 11-th Nordic Meeting on Intermediate and High Energy Nuclear Physics, Gräftåvallen, Sweden, 1995.

Ruprecht Machleidt

Publications

Reviews and Book Chapters

147. *Nuclear forces from chiral effective field theory*, R. Machleidt, in: NN and 3N Interactions, edited by L. Blokhintsev and I. Strakvsky (NOVA, New York, 2014) Chapter 1, pp. 1-42.

146. *Nuclear Forces*, R. Machleidt, Scholarpedia **9**(1), 30710 (2014).

145. *Nuclear Forces*, R. Machleidt, Lecture Series, International Scientific Meeting on Nuclear Physics, La Rábida, Huelva (Spain), September 2012, AIP Conference Proceedings **1541**, 61-103 (2013).

144. *Chiral effective field theory and nuclear forces*, R. Machleidt and D. R. Entem, **Physics Reports** 503, pp. 1-75 (2011).

143. *Chiral symmetry and the nucleon-nucleon interaction*, R. Machleidt, in: From Nuclei to Stars—Festschrift in Honor of Gerald E. Brown, edited by Sabine Lee (World Scientific, Singapore, 2011), Chapter 14, pp. 317-343.

142. *Nuclear Forces from Chiral Effective Field Theory*, R. Machleidt, Lecture Series, Proc. DAE-BRNS Workshop on Physics and Astrophysics of Hadrons and Hadronic Matter, Visva Bharati University, Santiniketan, West Bengal, India (2007); Chapter (54 pages).

141. *The nucleon-nucleon interaction*, R. Machleidt and I. Slaus, Topical Review, J. Phys. G: Nucl. Part. Phys. **27**, R69-R108 (2001).

140. *Brueckner theory of nuclear matter with nonnucleonic degrees of freedom and relativity*, R. Machleidt, Proc. 10th International Conference on Recent Progress in Many-Body Theories, Seattle, Washington, USA, September 1999, Advances in Quantum Many-Body Theory, Vol. **3** (World Scientific, Singapore, 2000) pp. 247-262; Int J. Mod. Phys. **B15**, 1535 (2001).

139. *The Dirac Brueckner Approach*, R. Brockmann and R. Machleidt, in: Int. Rev. Nucl. Phys., Vol. **8**, Nuclear Methods and the Nuclear Equation of State, M. Baldo, ed. (World Scientific, Singapore, 1999) Chapter 2.

138. *Nucleon-nucleon potentials in comparison: physics or polemics?*, R. Machleidt and G. Q. Li, Physics Reports, **242**, 5 (1994).

137. *One-boson-exchange potentials and nucleon-nucleon scattering*, R. Machleidt, in: Computational Nuclear Physics 2 — Nuclear Reactions, K.Langanke, J. A. Maruhn, and S. E. Koonin, eds. (Springer, New York, 1993) Chapter 1.

136. *The meson theory of nuclear forces and nuclear structure*, R. Machleidt, Advances in Nucl. Phys., Vol. **19**, Chapter 2, pp. 189-376 (1989).

135. *The Bonn meson-exchange model for the nucleon-nucleon interaction*, R. Machleidt, K. Holinde, and Ch. Elster, Phys. Reports, Vol. **149**, pp. 1-89 (1987).

134. *The meson theory of nuclear forces and nuclear matter*, R. Machleidt, Proc. Workshop on Relativistic Dynamics and Quark-Nuclear Physics, Los Alamos (NM, USA), 1985, eds. M. Johnson and A. Picklesimer (John Wiley, New York, 1986) pp. 71–174.

Refereed Publications

133. *Order-by-order convergence of nuclear matter, neutron matter, and symmetry energy predictions in chiral effective field theory*, F. Sammarruca, L. Coraggio, J. W. Holt, N. Itaco, R. Machleidt, and L. E. Marcucci, Phys. Rev. C, submitted.

132. *Statistical uncertainties of a chiral interaction at next-to-next-to leading order*, J. A. Ekstrom, B. Carlsson, K. Wendt, Ch. Forssen, M. Hjorth-Jensen, R. Machleidt, S. Wild, J. Phys. G: Nucl. Part. Phys., in press.

131. *Peripheral nucleon-nucleon scattering at fifth order of chiral perturbation theory*, D. R. Entem, N. Kaiser, R. Machleidt, and Y. Nosyk, Phys. Rev. C **91**, 014002 (2015).

130. *Muon capture on the deuteron and the neutron-neutron scattering length*, L. E. Marcucci and R. Machleidt, Phys. Rev. C **90**, 054001 (2014).

129. *The nuclear matter equation of state with consistent two- and three-body perturbative chiral interactions*, L. Coraggio, J. W. Holt, N. Itaco, R. Machleidt, L. E. Marcucci, and F. Sammarruca, Phys. Rev. C **89**, 044321 (2014).

128. *Origin and properties of strong inter-nucleon interactions*, R. Machleidt, in : Nuclear Theory in the Supercomputing Era - 2013, edited by A. M. Shirokov and A. I. Mazur (Pacific National University, Khabarovsk, Russia, 2014) p. 336.

127. *Chiral effective field theory for nuclear forces: Achievements and challenges*, R. Machleidt, EPJ Web of Conferences **66**, 01011 (2014).

126. *Nonperturbative renormalization of the chiral nucleon-nucleon interaction up to next-to-next-to-leading order*, E. Marji, A. Canul, Q. MacPherson, R. Winzer, C. Zeoli, D. R. Entem, and R. Machleidt, Phys. Rev. C **88**, 054002 (2013).

125. *Optimized chiral nucleon-nucleon interaction at next-to-next-to-leading order*, A. Ekström, G. Baardsen, C. Forssén, G. Hagen, M. Hjorth-Jensen, G. R. Jansen, R. Machleidt, W. Nazarewicz, T. Papenbrock, J. Sarich, and S. M. Wild, Phys. Rev. Lett. **110**, 192502 (2013).

124. *Recent Progress in the Theory of Nuclear Forces*, R. Machleidt, Q. MacPherson, E. Marji, R. Winzer, C. Zeoli and D. R. Entem, Few-Body Systems **54**, 821 (2013).

123. *Half-Skyrmions and the Equation of State for Compact-Star Matter*, H. Dong, T. T. S. Kuo, H. K. Lee, R. Machleidt and M. Rho, Phys. Rev. C **87**, 054332 (2013).

122. *Reduced regulator dependence of neutron-matter predictions with chiral interactions*, L. Coraggio, J. W. Holt, N. Itaco, R. Machleidt and F. Sammarruca, Phys. Rev. C **87**, 014322 (2013).

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