
CURRICULUM VITAE

Summary of Qualifications

- High precision measurements
- Design of experimental apparatus
- Data analysis, statistics and error analysis
- Advanced electronic and software skills

Professional Background

Education

Dipl. Physiker (distinguished), University of Regensburg, Germany
Dr. sci. nat. (distinguished), University of Zürich, Switzerland

Thesis

Diploma thesis: “Electrical and crystallographic characterization of high-k materials”
Dissertation: “Determination of the gravitational constant using a beam balance”

Research Experience

- 2016 - present Supervisory Physicist at the National Institute of Standards and Technology, NIST
- Leading the fundamental electrical measurement group
- 2013 - 2016 Physicist at the National Institute of Standards and Technology, NIST
- Working on the design of a watt balance to realize the unit of mass after redefinition of the SI.
 - Leading a small team to measure the Planck constant, h .
- 2010 - 2013 Detailed to the National Institute of Standards and Technology, NIST
- see above
- 2006 - 2010 Research Assistant Professor, UNIVERSITY OF WASHINGTON
2003 - 2006 Research Associate (post-doc), UNIVERSITY OF WASHINGTON
- Worked on an experiment to test the weak equivalence principle.
 - Built instruments to test various aspects of gravitational wave detectors.
 - Started collaboration between UW with LIGO.
- 1998 - 2002 Graduate student, UNIVERSITY OF ZÜRICH
- Performed a precise determination of the gravitational constant, G .
- 1997 - 1998 Undergraduate student, Siemens semiconductor and UNIVERSITY OF REGENSBURG
- Worked on the optimization and characterization of the dielectric layer in DRAM capacitors.

Teaching Experience

- 2002 - 2010 UNIVERSITY OF WASHINGTON
- Taught Physics 225, Modern Physics, in the spring quarter 2007.
 - Advised graduate students in their research projects.
 - Supervised undergraduate students in their independent studies or in the scope of the REU (research experience for undergraduate) program.
- 1998 - 2002 UNIVERSITY OF ZÜRICH
- Assisted in lectures of Prof. Hugo Keller, “Physics for medical students”.
 - Tutored “Atomic Physics 1 and 2” lectured by Prof. Hugo Keller.
 - Tutored “Statistics and Data Analysis” lectured by PD Eugen Holzschuh.
 - Taught the basic physic lab for medical students.

1996 - 1997 UNIVERSITY OF REGENSBURG

- Tutored “Crystallography 1 and 2” lectured by Prof. Henning von Philipsborn.

Patents

1. US2012/0242999 INTERFEROMETRIC QUASI-AUTOCOLLIMATOR, M.D. Turner, J.H. Gundlach, C.A. Hagedorn, S. Schlamminger.
2. US2001/0031526A1 DRAM MEMORY CAPACITOR AND METHOD FOR ITS PRODUCTION, G. Beitel, M. Franosch, T.P. Haneder, G. Lange, H. Reisinger, H. Schäfer, S. Schlamminger, H. Wendt.
3. US6,522,385B2 DRAM MEMORY CAPACITOR HAVING THREE-LAYER DIELECTRIC AND METHOD FOR ITS PRODUCTION, G. Beitel, M. Franosch, T.P. Haneder, G. Lange, H. Reisinger, H. Schäfer, S. Schlamminger, H. Wendt.

Peer Reviewed Publications

1. BRIDGING CLASSICAL AND QUANTUM MECHANICS, D. Haddad, F. Seifert, L.S. Chao, S. Li, D.B. Newell, J.R. Pratt, C. Williams, S. Schlamminger, accepted for publication in Metrologia 2016
2. THE WATT OR KIBBLE BALANCE: A TECHNIQUE FOR IMPLEMENTING THE NEW SI DEFINITION OF THE UNIT OF MASS, I.A. Robinson and S. Schlamminger, accepted for publication in Metrologia 2016
3. INVITED ARTICLE: A PRECISE INSTRUMENT TO DETERMINE THE PLANCK CONSTANT, AND THE FUTURE KILOGRAM, D. Haddad, F. Seifert, L.S. Chao, S. Li, D.B. Newell, J.R. Pratt, C. Williams, S. Schlamminger, Rev. Sci. Instrum. **87** 061301 (2016).
<http://scitation.aip.org/content/aip/journal/rsi/87/6/10.1063/1.4953825>
4. COIL MOTION EFFECTS IN WATT BALANCES: A THEORETICAL CHECK, S. Li, S. Schlamminger, D. Haddad, F. Seifert, L. Chao, J.R. Pratt, Metrologia **53** 817 (2016).
<http://iopscience.iop.org/article/10.1088/0026-1394/53/2/817/pdf>
5. RECENT MEASUREMENTS OF THE GRAVITATIONAL CONSTANT AS A FUNCTION OF TIME, S. Schlamminger, J.H. Gundlach, R.D. Newman, Phys. Rev. D. **91** 121101 (2015).
<http://arxiv.org/abs/1412.4143>
6. A LEGO WATT BALANCE: AN APPARATUS TO DEMONSTRATE THE DEFINITION OF MASS BASED ON THE NEW SI, L.S. Chao, S. Schlamminger, D.B. Newell, J.R. Pratt, G. Sineriz, A. Cao, D. Haddad, X. Zhang, Am. J. Phys. **83** 913 (2015).
<http://arxiv.org/abs/1412.1699>
7. A DETERMINATION OF THE LOCAL ACCELERATION OF GRAVITY FOR THE NIST-4 WATT BALANCE, E.J. Leaman, D. Haddad, F. Seifert, L.S. Chao, A. Cao, J.R. Pratt, S. Schlamminger, and D.B. Newell, IEEE Trans. Instr. Meas. **64** 1663 (2015).
<http://arxiv.org/abs/1412.4143>
8. A SUMMARY OF THE PLANCK CONSTANT MEASUREMENTS USING A WATT BALANCE WITH A SUPERCONDUCTING SOLENOID AT NIST, S. Schlamminger, R.L. Steiner, D. Haddad, D.B. Newell, F. Seifert, L.S. Chao, R. Liu, E.R. Williams, J.R. Pratt, Metrologia. **52** L5 (2015). <http://arxiv.org/abs/1501.06796>
9. A SUMMARY OF THE PLANCK CONSTANT MEASUREMENTS USING A WATT BALANCE WITH A SUPERCONDUCTING SOLENOID AT NIST, S. Schlamminger, R.L. Steiner, D. Haddad, D.B. Newell, F. Seifert, L.S. Chao, R. Liu, E.R. Williams, J.R. Pratt, Metrologia 52 L5 (2015).
<http://arxiv.org/abs/1501.06796>
10. CONSTRUCTION, MEASUREMENT, SHIMMING, AND PERFORMANCE OF THE NIST-4 MAGNET SYSTEM, F. Seifert, A. Panna, S. Li, B. Han, L. Chao, A. Cao, D. Haddad, H. Choi, L. Haley, S. Schlamminger, IEEE Trans. Instr. Meas. **63**, 3027 (2014).
<http://arxiv.org/abs/1405.1450>

11. REFLECTIONS ON A MEASUREMENT OF THE GRAVITATIONAL CONSTANT USING A BEAM BALANCE AND 13 TONS OF MERCURY, S Schlamminger, RE Pixley, F Nolting, J Schurr, and U Straumann, *Phil. Trans. Roy. Soc. A* **372**, 20140027 (2014).
<http://arxiv.org/abs/1407.5214>
12. A NONLINEARITY IN PERMANENT-MAGNET SYSTEMS USED IN WATT BALANCES, S. Li, S. Schlamminger, and J. R. Pratt, *Metrologia* **51** 394 (2014).
<http://arxiv.org/abs/1405.1904>
13. DETERMINATION OF THE PLANCK CONSTANT USING A WATT BALANCE WITH A SUPERCONDUCTING MAGNET SYSTEM AT THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, S. Schlamminger, D. Haddad, F. Seifert, L.S. Chao, D.B. Newell, R. Liu, R.L. Steiner, and J. R. Pratt, *Metrologia* **51** S15 (2014).
<http://arxiv.org/abs/1401.8160>
14. A REFERENCE-BEAM AUTOCOLLIMATOR WITH NANORADIAN SENSITIVITY FROM MHz TO KHz AND DYNAMIC RANGE OF 10^7 , T. B. Arp, C. A. Hagedorn, S. Schlamminger, and J. H. Gundlach, *Rev. Sci. Instrum.* **84**, 095007 (2013).
<http://arxiv.org/abs/1309.4828>
15. DESIGN OF THE PERMANENT-MAGNET SYSTEM FOR NIST-4, S. Schlamminger *IEEE Trans. Instr. Meas.* **62**, 1524 (2013).
16. A 10V PROGRAMMABLE JOSEPHSON VOLTAGE STANDARD AND ITS APPLICATIONS FOR VOLTAGE METROLOGY, Y. Tang, V.N. Ojha, S. Schlamminger, A. Rüfenacht, C.J. Burroughs, P.D. Dresselhaus, and S.P. Benz, *Metrologia* **49**, 635 (2012).
17. SEARCH FOR GRAVITATIONAL WAVES FROM LOW MASS COMPACT BINARY COALESCENCE IN LIGOS SIXTH SCIENCE RUN AND VIRGOS SCIENCE RUNS 2 AND 3, J. Abadie et al., *Phys. Rev. D* **85**, 082002 (2012).
18. ALL-SKY SEARCH FOR PERIODIC GRAVITATIONAL WAVES IN THE FULL S5 LIGO DATA, J. Abadie et al., *Phys. Rev. D* **85**, 022001 (2012).
19. IMPLEMENTATION AND TESTING OF THE FIRST PROMPT SEARCH FOR ELECTROMAGNETIC COUNTERPARTS TO GRAVITATIONAL WAVE TRANSIENTS, J. Abadie et al., *Astronomy and Astrophysics* **539**, A124 (2012).
20. TORSION-BALANCE TESTS OF THE WEAK EQUIVALENCE PRINCIPLE, T.A. Wagner, S. Schlamminger, J.H. Gundlach, and E.G. Adelberger, *Class. Quantum Grav.* **29**, 184002 (2012).
21. BROWNIAN FORCE NOISE FROM MOLECULAR COLLISIONS AND THE SENSITIVITY OF ADVANCED GRAVITATIONAL WAVE OBSERVATORIES, R. Dolesi, M. Hueller, D. Nicolodi, D. Tombolato, S. Vitale, P.J. Wass, W.J. Weber, M. Evans, P. Fritschel, R. Weiss, J.H. Gundlach, C.A. Hagedorn, S. Schlamminger, G. Ciani, and A. Cavalleri, *Physical Review D* **84**, 063007 (2011).
22. A GRAVITATIONAL WAVE OBSERVATORY OPERATING BEYOND THE QUANTUM SHOT-NOISE LIMIT, J. Abadie et al., *Nature Physics* **7**, 962 (2011).
23. BEATING THE SPIN-DOWN LIMIT ON GRAVITATIONAL WAVE EMISSION FROM THE VELA PULSAR, J. Abadie et al., *The Astrophysical Journal* **737**, 93 (2011).
24. SEARCH FOR GRAVITATIONAL WAVE BURSTS FROM SIX MAGNETARS, J. Abadie et al., *The Astrophysical Journal Letters* **734**, L35 (2011).
25. PICORADIAN DEFLECTION MEASUREMENT WITH AN INTERFEROMETRIC QUASI-AUTOCOLLIMATOR USING WEAK VALUE AMPLIFICATION, M.D. Turner, C.A. Hagedorn, S. Schlamminger, and J.H. Gundlach, *Optics Letters* **36**, 1479 (2011).

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26. REMOVAL OF ZERO-POINT DRIFT FROM AB DATA AND THE STATISTICAL COST, H.E. Swanson and S. Schlamminger, *Measurement Science and Technology* **21**, 115104 (2010).
 27. INDIRECT EVIDENCE FOR LÉVY WALKS IN SQUEEZE FILM DAMPING, S. Schlamminger, C.A. Hagedorn, and J.H. Gundlach, *Physical Review D* **81**, 123008 (2010).
 28. CHARGE MANAGEMENT FOR GRAVITATIONAL WAVE OBSERVATORIES USING UV LEDs, S.E. Pollack, M.D. Turner, S. Schlamminger, C.A. Hagedorn, and J.H. Gundlach, *Physical Review D* **81**, 021101(R) (2010).
 29. IMPLICATIONS FOR THE ORIGIN OF GRB 051103 FROM LIGO OBSERVATIONS, J. Abadie et al., *The Astrophysical Journal* **755**, 2 (2010).
 30. LABORATORY TESTS OF THE EQUIVALENCE PRINCIPLE AT THE UNIVERSITY OF WASHINGTON, J. H. Gundlach, S. Schlamminger, and T. A. Wagner, *Space Science Review* **148**, 201 (2009).
 31. TORSION BALANCE EXPERIMENTS: A LOW-ENERGY FRONTIER OF PARTICLE PHYSICS, E.G. Adelberger, J.H. Gundlach, B.R. Heckel, S. Hoedl, and S. Schlamminger, *Progress in Particle and Nuclear Physics* **62**, 102 (2009).
 32. PREFERRED-FRAME AND CP-VIOLATION TESTS WITH POLARIZED ELECTRONS, B.R. Heckel, E.G. Adelberger, C.E. Cramer, T.S. Cook, S. Schlamminger, and U. Schmidt, *Physical Review D* **78**, 092006 (2008).
 33. TEMPORAL EXTEND OF SURFACE POTENTIALS BETWEEN CLOSELY SPACED METALS, S.E. Pollack, S. Schlamminger, and J.H. Gundlach, *Physical Review Letters* **101**, 071101 (2008).
 34. TEST OF THE EQUIVALENCE PRINCIPLE USING A ROTATING TORSION BALANCE, S. Schlamminger, K.-Y. Choi, T. Wagner, J.H. Gundlach, and E.G. Adelberger, *Physical Review Letters* **100** No. 4, p. 041101 (2008).
 35. LABORATORY TEST OF NEWTON'S SECOND LAW FOR SMALL ACCELERATIONS, J.H. Gundlach, S. Schlamminger, C.D. Spitzer, K.-Y. Choi, B.A. Woodahl, J.J. Coy, and E. Fischbach, *Physical Review Letters* **98** No. 15, p. 150801 (2007).
 36. MEASUREMENT OF NEWTON'S GRAVITATIONAL CONSTANT, St. Schlamminger, E. Holzschuh, W. Kündig, F. Nolting, R.E. Pixley, J. Schurr, and U. Straumann, *Physical Review D* **74** No. 8, p. 082001 (2006).
 37. NEW CP-VIOLATION AND PREFERRED-FRAME TESTS WITH POLARIZED ELECTRONS, B.R. Heckel, C.E. Cramer, T.S. Cook, E.G. Adelberger, S. Schlamminger, and U. Schmidt, *Physical Review Letters* **97** No. 2, p. 021603 (2006).
 38. DETERMINATION OF THE GRAVITATIONAL CONSTANT WITH A BEAM BALANCE, St. Schlamminger, E. Holzschuh, and W. Kündig, *Physical Review Letters* **89** No. 16, p. 161102 (2002).
 39. A VALUE FOR G FROM BEAM-BALANCE EXPERIMENTS, F. Nolting, J. Schurr, St. Schlamminger and W. Kündig, *Measurement Science and Technology* **10** No. 6, p 487 (1999).

Other Publications

1. FUNDAMENTAL CONSTANTS: A COOL WAY TO MEASURE BIG G, S. Schlamminger, *Nature* **510** 478 (2014).
2. DETERMINATION OF THE GRAVITATIONAL CONSTANT BY MEANS OF A BEAM BALANCE, F. Nolting, J. Schurr, St. Schlamminger and W. Kündig, *Europhysics News* Juli/August 2000.
3. HOFFNUNG FÜR DIE GRAVITATIONS KONSTANTE, St. Schlamminger, *Physikalische Blätter* **56**, 15 (1999).
4. DIE GRAVITATIONS KONSTANTE - EINE HERAUSFORDERUNG AN DIE MESSTECHNIK, F. Nolting, J. Schurr, St. Schlamminger and W. Kündig, *Physikalische Blätter* **55**, 51 (1999).

Book contributions

1. DETERMINATION OF THE GRAVITATIONAL CONSTANT, St. Schlamminger, E. Holzschuh, W. Kündig, F. Nolting, J. Schurr, in C. Lämmerzahl, C.W.F. Everitt, and F.W. Hehl (Eds.): Gyros, Clocks, Interferometers ...: Testing Relativistic Gravity in Space, Lecture Notes in Physics, Springer, 2001.

Invited Talks

1. 06/22/2016 WATT BALANCES: PROVIDING A DIRECT ROUTE FROM QUANTUM ELECTRICAL STANDARDS TO THE UNIT OF MASS, Helmholtz Symposium, Braunschweig, Germany.
2. 06/15/2016 WATT BALANCES AND THE MEASUREMENT OF h , 22nd meeting of the Consultative Committee for Units (CCU), Sevre, France.
3. 04/18/2016 MEASUREMENT OF THE GRAVITATIONAL CONSTANT – WHY WE NEED NEW IDEAS, April meeting of the American Physical Society (APS), Salt Lake City, UT.
4. 02/18/2016 MEASUREMENT OF THE PLANCK CONSTANT AND THE REVISION OF THE SI, Colloquium at the George Washington University, Washington DC.
5. 10/24/2015 MEASUREMENT OF THE PLANCK CONSTANT AND THE REVISION OF THE SI, Mid-Atlantic section meeting of the APS, Morgantown, WV.
6. 03/19/2015 MEASUREMENT OF THE PLANCK CONSTANT AND THE REVISION OF THE SI, NIST Center for Neutron Research Colloquium, Gaithersburg, MD.
02/04/2015 A MEASUREMENT OF h USING A WATT BALANCE, Fundamental Constants Meeting, Eltville, Germany.
11/07/2014 MEASUREMENT OF THE PLANCK CONSTANT AND THE REVISION OF THE SI, University of Kentucky, Lexington, KY, Colloquium.
7. 07/15/2013 MEASUREMENT OF THE PLANCK CONSTANT AND THE REVISION OF THE SI, Max Planck Institute for Quantum Optics, Munich, Germany, Colloquium.
8. 06/04/2012 THE ELECTRONIC KILOGRAM THE PAST, PRESENT, AND FUTURE, TU Ilmenau, Ilmenau, Germany, Colloquium at the Mechanical Engineering Department.
9. 09/12/2012 THE PLANCK CONSTANT, h , AND THE REDEFINITION OF THE SI, Washington University of St. Louis, St. Louis, MO, Department of Physics Colloquium.
10. 09/19/2012 THE PLANCK CONSTANT, h , AND THE REDEFINITION OF THE SI, Mid Atlantic Senior Physicists Group, College Park, MD, Monthly meeting talk.
11. 10/18/2012 TOWARDS A NEW SI WITH AN ELECTRONIC KILOGRAM, Syracuse University, Syracuse, NY, Physics Colloquium.
12. 11/14/2012 THE PLANCK CONSTANT AND THE REDEFINITION OF THE SI, University of Notre Dame, South Bend, IN, Physics Colloquium.
13. 11/29/2012 THE PLANCK CONSTANT AND THE REDEFINITION OF THE SI, NASA, Goddard Space Flight Center, Greenbelt, MD, Astrophysics Group Seminar.
14. 06/28/2011 PRECISION TABLE TOP EXPERIMENTS, University of Heidelberg, Heidelberg, Germany Colloquium at the Physics Department.
15. 07/21/2011 THE ELECTRONIC KILOGRAM, University of Trento, Physics Department Seminar.
16. 11/07/2011 THE ELECTRONIC KILOGRAM THE PAST, PRESENT, AND FUTURE, University of Washington, Seattle, WA Physics Colloquium.
17. 01/08/2010 PRECISE MECHANICAL EXPERIMENTS FOR METROLOGY AND FUNDAMENTAL PHYSICS, NIST Gaithersburg, Seminar.

18. 02/14/2010 LABORATORY TESTS OF THE INVERSE SQUARE LAW OF GRAVITY, APS April Meeting, Washington DC.
19. 04/13/2010 TESTS OF THE EQUIVALENCE PRINCIPLE IN THE LABORATORY, University of Virginia, Charlottesville, VA, Seminar.
20. 07/07/2010 PRECISION TESTS OF THE EQUIVALENCE PRINCIPLE, General Relativity 19, Mexico City, Mexico.
21. 11/10/2010 TABLE TOP TESTS OF GRAVITATION, University of Maryland, College Park, Maryland, Seminar.
22. 12/15/2010 LABORATORY TESTS OF GRAVITATION, ETH Zürich, Zürich, Switzerland, The Zürich Physics Colloquium.
23. 12/09/2008 A HIGH PRECISION TEST OF THE EQUIVALENCE OF INERTIAL AND GRAVITATIONAL MASS, NRC-INMS Ottawa, Ontario, Canada, Seminar.
24. 05/12/2008 A HIGH PRECISION TEST OF THE EQUIVALENCE OF INERTIAL AND GRAVITATIONAL MASS, Art Institute Seattle, Seattle, WA, Physics Seminar.
25. 11/29/2007 HIGH PRECISION TEST OF THE EQUIVALENCE PRINCIPLE, Triangle Universities Nuclear Laboratory, Durham, North Carolina, TUNL Seminar.
26. 11/09/2007 A HIGH PRECISION TEST OF THE EQUIVALENCE PRINCIPLE, University of Puget Sound, Tacoma, Washington, 2007 Physics Seminar.
27. 04/14/2007 IMPROVED TEST OF THE EQUIVALENCE PRINCIPLE, APS April Meeting 2007, Jacksonville, Florida
28. 01/18/2007 EXCITING PHYSICS WITH TORSION BALANCES, Universität Zürich, Seminar in Experimental Physics, Zürich, Switzerland.

Awards

Allen V. Astin Measurement Science Award 2016
Nominated for Fellowship of the American Physical Society 2015
Department of Commerce Silver Medal 2014

Service

- 2016 Guest-Editor for Metrologia focus issue titled “Realization, Maintenance and Dissemination of the Kilogram in the Revised SI”
- 2014 Interim-Past-Chair of the Mid-Atlantic Section of the American Physics Society
- 2012-2013 Interim-Chair of the Mid-Atlantic Section of the American Physics Society
- 2012 help start the Mid-Atlantic Section of the American Physics Society

Affiliations

American Physical Society, Institute of Electrical and Electronics Engineers