

Curriculum Vitae (CV) of Tom Kirchner

A. Personal

Tom Kurt Rainer Kirchner, Dr. phil. nat. (Frankfurt), Professor of Physics
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1. Degrees

- 06/1999 Dr. phil. nat. (“summa cum laude”), Institut für Theoretische Physik der Johann Wolfgang Goethe-Universität, Frankfurt a.M., Germany. Thesis (supervisor: Prof. Dr. R. M. Dreizler): “A quantum mechanical description of many-electron processes in ion-atom collisions”
- 07/1995 ‘Diplom-Physiker’ (“mit Auszeichnung”), Johann Wolfgang Goethe-Universität, Frankfurt a.M., Germany. Thesis (supervisor: Prof. Dr. R. M. Dreizler): “Models for the analysis of optical potentials for time-dependent quantum systems”

2. Employment History

- since 01/2019 Professor (Theoretical Atomic Physics) at the Department of Physics and Astronomy, York University
- 07/2012 – 12/2018 Associate Professor (Theoretical Atomic Physics) at the Department of Physics and Astronomy, York University (w/ tenure)
- 07/2008 – 06/2012 Assistant Professor (Theoretical Atomic Physics) at the Department of Physics and Astronomy, York University (tenure track)
- 03/2003 – 02/2009 “Juniorprofessor” at the Institut für Theoretische Physik, Clausthal University of Technology, Germany (w/o tenure)
- 03/2002 – 02/2003 Postdoctoral research staff with Prof. Dr. J. Ullrich at the Max-Planck-Institut für Kernphysik, Heidelberg, Germany
- 09/1999 – 02/2002 Postdoctoral fellow with Prof. Dr. M. Horbatsch at the Department of Physics and Astronomy, York University, Toronto, Ontario, Canada
- 05/1998 – 08/1999 Research assistant at the Institut für Theoretische Physik, Johann Wolfgang Goethe-Universität Frankfurt a.M., Germany

3. Honours and Awards

- 2016 Outstanding Referee for the journals of the American Physical Society
- 2013 Fellow of the American Physical Society
- 09/1999 – 08/2001 Postdoctoral Fellowship awarded by the German Academic Exchange Service (Deutscher Akademischer Austauschdienst, DAAD)
- 08/1995 – 05/1998 Graduate Scholarship of the Graduiertenkolleg *Theoretische und experimentelle Schwerionenphysik Frankfurt/Gießen* (Germany)
- 07/1995 Thesis Prize of the WE Heraeus Foundation (Germany)

B. Scholarly and Professional Contributions

The principal theme of my research is the theoretical description of the few-particle dynamics of complex Coulomb systems. How do atomic and molecular few-body systems respond to perturbations exerted on them by impinging particles and external fields? Can their dynamics be manipulated purposefully and controlled actively? We are looking for answers to these questions through theoretical analysis and computations. The approaches used include density-functional-theory-based methods to deal with the many-particle aspects and both nonperturbative and perturbative quantum methods to describe the dynamics of the systems under study. Over the last few years, we have focused our efforts on developing methods to describe the ionization and fragmentation of multi-center molecules. First applications were concerned with ion-induced fragmentation of water. More recently, we have studied larger atomic and molecular clusters and biomolecules such as DNA and RNA nucleobases with the goal to contribute to the quantitative understanding of the problem of radiation damage of biological tissue.

1. Summary of Publications and Professional Contributions

- 98 refereed publications (including three publications in Phys. Rev. Lett.) and two submitted
- Four published book chapters and two forthcoming
- 33 invited talks at international conferences and meetings
- 30 invited seminar and colloquium talks
- 128 oral and poster contributions at international conferences
- 44 oral and poster contributions at national conferences in Canada and Germany

2. Publications

Book Chapters and Review Articles

1. H. Chung, B. J. Braams, K. Bartschat, A. G. Császár, G. W. F. Drake, T. Kirchner, V. Kokoouline, and J. Tennyson 2016, *Uncertainty estimates for theoretical atomic and molecular data*, J. Phys. D **49**, 363002(1–27) (Topical Review).
2. M. Schulz, A. L. Harris, T. Kirchner, and D. H. Madison, *Electron capture processes in ion-atom collisions at intermediate projectile energies*, in: *Interdisciplinary Research on Particle Collisions and Quantitative Spectroscopy*, Vol. **1: Fast Ion-Atom and Ion-Molecule Collisions, edited by Dž. Belkić, (World Scientific Publishing, Singapore 2013), pp. 1–26.**
3. T. Kirchner, M. Zapukhlyak, M. F. Ciappina, and M. Schulz, *Recent advances in the theory and the modelling of multiple processes in heavy-particle collisions*, in: *Interdisciplinary Research on Particle Collisions and Quantitative Spectroscopy*, Vol. **1: Fast Ion-Atom and Ion-Molecule Collisions, edited by Dž. Belkić, (World Scientific Publishing, Singapore 2013), pp. 55–91.**

4. T. Kirchner, M. Murakami, M. Horbatsch, and H. J. Lüdde, *Ion collisions with water molecules: a time-dependent density functional theory approach*, in: *Advances in Quantum Chemistry*, Vol. **65**: *Theory of Heavy Ion Collision Physics in Hadron Therapy*, edited by Dž. Belkić, (Elsevier, Amsterdam 2013), pp. 315–337.
5. T. Kirchner and H. Knudsen 2011, *Current status of antiproton impact ionization of atoms and molecules: theoretical and experimental perspectives*, J. Phys. B **44**, 122001(1–49) (Topical Review).
6. T. Kirchner, H. J. Lüdde, and M. Horbatsch 2004, *A time-dependent quantal approach to electronic transitions in atomic collisions*, Recent Res. Devel. Physics, **5**, 433–461.
7. T. Kirchner 2003, *Electron interaction effects in ion-induced rearrangement and ionization dynamics: a theoretical perspective*, in: *Many-Particle Quantum Dynamics in Atomic and Molecular Fragmentation*, edited by V. P. Shevelko and J. Ullrich, (Springer, Berlin 2003), pp. 447–462.

Articles in Refereed Journals

8. H. J. Lüdde, M. Horbatsch, and T. Kirchner 2019, *Proton-impact-induced electron emission from biologically relevant molecules studied with a screened independent atom model*, J. Phys. B **52**, 195203(1–11).
9. F. Aumayr, K. Ueda, E. Sokell, S. Schippers, H. Sadeghpour, F. Merkt, T. Gallagher, F. B. Dunning, P. Scheier, O. Echt, T. Kirchner, S. Fritzsche, A. Surzhykov, X. Ma, R. Rivarola, O. Fojon, L. Tribedi, E. Lamour, J. Crespo López-Urrutia, Y. A. Litvinov, V. Shabaev, H. Cederquist, H. Zettergren, M. Schleberger, R. A. Wilhelm, T. Azuma, P. Boduch, H. T. Schmidt, and T. Stöhlker 2019, *Roadmap on photonic, electronic and atomic collision physics: III. Heavy particles: with zero to relativistic speeds*, J. Phys. B. **52**, 171003
10. A. Jorge, M. Horbatsch, C. Illescas, and T. Kirchner 2019, *Classical-trajectory Monte Carlo calculations of differential electron-emission cross sections in fast heavy-ion collisions with water molecules*, Phys. Rev. A **99**, 062701(1–13).
11. A. C. K. Leung and T. Kirchner 2019, *Capture cross sections and radiative emission-line strengths for slow Ne^{8+} collisions with He and H_2* , Atoms **7**, 15(1–12).
12. A. C. K. Leung and T. Kirchner 2018, *Lyman line ratios in charge-exchange collisions of C^{6+} and O^{8+} ions with hydrogen and krypton atoms*, Phys. Rev. A **97**, 062705(1–9).
13. H. J. Lüdde, M. Horbatsch, and T. Kirchner 2018, *A screened independent atom model for the description of ion collisions from atomic and molecular clusters*, Eur. Phys. J. B **91**, 99(1–12)
14. M. Baxter, T. Kirchner, and E. Engel 2017, *Time-dependent spin-density-functional-theory description of He^+ -He collisions*, Phys. Rev. A **96**, 032708(1–9).
15. A. C. Vutha, T. Kirchner, and P. Dubé 2017, *Collisional frequency shift of a trapped-ion optical clock*, Phys. Rev. A **96**, 022704(1–5).

16. A. C. K. Leung and T. Kirchner 2017, *Radiative-emission analysis in charge-exchange collisions of O^{6+} with argon, water, and methane*, Phys. Rev. A **95**, 042703(1–10).
17. A. Salehzadeh and T. Kirchner 2017, *Fragmentation of methane molecules by proton and antiproton impact*, Eur. Phys. J. D **71**, 66(1–9).
18. A. C. K. Leung and T. Kirchner 2016, *Analysis of x-ray emission spectra in charge-exchange collisions of C^{6+} with He and H_2* , Phys. Rev. A **93**, 052710(1–11).
19. H. Luna, W. Wolff, A. C. Tavares, E. C. Montenegro, H. J. Lüdde, G. Schenk, M. Horbatsch, and T. Kirchner 2016, *Ionization and electron capture cross sections for single- and multiple-electron removal from H_2O by Li^{3+} impact*, Phys. Rev. A **93**, 052705(1–12).
20. H. J. Lüdde, A. Achenbach, T. Kalkbrenner, H.-C. Jankowiak, and T. Kirchner 2016, *An independent-atom-model description of ion-molecule collisions including geometric screening corrections*, Eur. Phys. J. D **70**, 82(1–6).
21. M. D. Śpiewanowski, L. Gulyás, M. Horbatsch, and T. Kirchner 2016, *Doubly-differential cross section calculations for K-shell vacancy production in lithium by fast O^{8+} ion impact*, Phys. Rev. A **93**, 012707(1–7).
22. M. Baxter and T. Kirchner 2016, *Time-dependent density functional theory studies of collisions involving He atoms: extension of an adiabatic correlation-integral model*, Phys. Rev. A **93**, 012502(1–13).
23. A. C. K. Leung and T. Kirchner 2015, *An independent electron analysis of the x-ray spectra from single electron capture in Ne^{10+} collisions from He, Ne, and Ar atoms*, Phys. Rev. A **92**, 032712(1–10).
24. G. Schenk and T. Kirchner 2015, *Multiple ionization of neon atoms in collisions with bare and dressed ions: A mean-field description considering target response*, Phys. Rev. A **91**, 052712(1–11).
25. L. Gulyás, S. Egri, and T. Kirchner 2014, *Differential cross sections for single ionization of Li in collisions with fast protons and O^{8+} ions*, Phys. Rev. A **90**, 062710(1–10).
26. T. Kirchner, N. Khazai, and L. Gulyás 2014, *Role of two-electron excitation-ionization processes in the ionization of lithium atoms by fast ion impact*, Phys. Rev. A **89**, 062702(1–8).
27. G. Schenk, M. Horbatsch, and T. Kirchner 2013, *Role of projectile electrons for target-recoil-charge-state production in intermediate-energy B^{2+} -Ne collisions*, Phys. Rev. A **88**, 012712(1–5).
28. M. Baxter and T. Kirchner 2013, *Correlation in time-dependent density-functional-theory studies of antiproton-helium collisions*, Phys. Rev. A **87**, 062507(1–8).
29. A. Salehzadeh and T. Kirchner 2013, *Strong multiple-capture effect in slow Ar^{17+} -Ar collisions: a quantum mechanical analysis*, J. Phys. B **46**, 025201(1–8).

30. M. Murakami, T. Kirchner, M. Horbatsch, and H. J. Lüdde 2012, *Quantum-mechanical calculation of multiple electron removal and fragmentation cross sections in $He^+ - H_2O$ collisions*, Phys. Rev. A **86**, 022719(1–8).
31. L. Gulyás, A. Igarashi, and T. Kirchner 2012, *Double and transfer ionization in collisions of He with bare ions*, Phys. Rev. A **86**, 024701(1–5).
32. K. Kato, D. W. Fitzakerley, M. C. George, A. C. Vutha, M. Weel, C. H. Storry, T. Kirchner, and E. A. Hessels 2012, *Selective detection of metastable helium atoms by elastic scattering collisions*, Phys. Rev. A **86**, 014702(1–4).
33. M. Murakami, T. Kirchner, and M. Horbatsch 2012, *A reduced-geometry independent particle model calculation of high harmonic generation from closed-shell diatomic molecules*, Can. J. Phys. **90**, 537–546.
34. M. Murakami, T. Kirchner, M. Horbatsch, and H. J. Lüdde 2012, *Fragmentation of water molecules by proton impact: the role of multiple electron processes*, Phys. Rev. A **85**, 052713(1–4).
35. M. Murakami, T. Kirchner, M. Horbatsch, and H. J. Lüdde 2012, *Single and multiple electron removal processes in proton-water molecule collisions*, Phys. Rev. A **85**, 052704(1–12).
36. M. F. Ciappina and T. Kirchner 2012, *SymbMat: symbolic computation of quantum transition matrix elements*, Comput. Phys. Communications **183**, 1832–1840.
37. L. Gulyás, A. Igarashi, and T. Kirchner 2012, *Projectile scattering in one- and two-electron transitions*, J. Phys. B **45**, 085205(1–11).
38. M. F. Ciappina, T. Kirchner, and M. Schulz 2011, *Double ionization of helium by highly-charged ion impact analyzed within the frozen correlation approximation*, Phys. Rev. A **84**, 034701(1–4).
39. M. F. Ciappina, M. Schulz, and T. Kirchner 2010, *Reaction dynamics in double ionization of helium by electron impact*, Phys. Rev. A **82**, 062701(1–8).
40. L. Gulyás, L. Sarkadi, A. Igarashi, and T. Kirchner 2010, *Two-electron cusp in the double ionization of helium*, Phys. Rev. A **82**, 032705(1–9).
41. M. F. Ciappina, T. Kirchner, M. Schulz, D. Fischer, R. Moshhammer, and J. Ullrich 2010, *Distorted wave theories applied to double ionization by ion impact: simulation of higher-order processes*, Journal of Atomic, Molecular, and Optical Physics **2010**, 231329(1–7).
42. D. Röhrbein, T. Kirchner, and S. Fritzsche 2010, *Role of cascade and Auger effects in the enhanced population of the $C^{6+}(1s2s2p\ ^4P)$ states following single-electron capture in $C^{4+}(1s2s\ ^3S) - He$ collisions*, Phys. Rev. A **81**, 042701(1–6).
43. M. F. Ciappina, T. Kirchner, and M. Schulz 2010, *Monte Carlo event generators in atomic collisions: a new tool to tackle the few-body dynamics*, Comput. Phys. Communications **181**, 813–820.

44. H. J. Lüdde, T. Spranger, M. Horbatsch, and T. Kirchner 2009, *Nonperturbative, quantum-mechanical approach to ion collisions from molecular targets*, Phys. Rev. A **80**, 060702(R)(1–4).
45. M. Zapukhlyak and T. Kirchner 2009, *Projectile angular-differential cross sections for electron transfer processes in ion-helium collisions: Evidence for the applicability of the independent electron model*, Phys. Rev. A **80**, 062705(1–7).
46. D. Fischer, M. Schulz, K. Schneider, M. F. Ciappina, T. Kirchner, A. Kelkar, S. Hagmann, M. Grieser, K.-U. Kühnel, R. Moshhammer, and J. Ullrich 2009, *Systematic analysis of double-ionization dynamics based on four-body Dalitz plots*, Phys. Rev. A **80**, 062703(1–8).
47. G. Schenk and T. Kirchner 2009, *Projectile electron loss in collisions of Ar^{6+} and Ar^{8+} ions with He and Ar atoms*, J. Phys. B: At. Mol. Opt. Phys. **42**, 205202(1–5).
48. N. Henkel, M. Keim, H. J. Lüdde, and T. Kirchner 2009, *Density-functional-theory investigation of antiproton-helium collisions*, Phys. Rev. A **80**, 032704(1–7).
49. M. Schulz, M. F. Ciappina, T. Kirchner, D. Fischer, R. Moshhammer, and J. Ullrich 2009, *Role of elastic projectile-electron scattering in double ionization of helium by fast proton impact*, Phys. Rev. A **79**, 042708(1–7).
50. L. Fernández-Menchero, T. Kirchner, and H. J. Lüdde 2009, *Extension of the basis generator method for application to laser-molecule interactions*, Phys. Rev. A **79**, 023416(1–6).
51. S. Knoop, D. Fischer, Y. Xue, M. Zapukhlyak, C. J. Osborne, Th. Ergler, T. Fergner, J. Braun, G. Brenner, H. Bruhns, C. Dimopoulou, S. W. Epp, A. J. González Martínez, G. Sikler, R. Soria Orts, H. Tawara, T. Kirchner, J. R. Crespo López-Urrutia, R. Moshhammer, J. Ullrich, and R. Hoekstra 2008, *Single-electron capture in keV $Ar^{15+...18+} + He$ collisions*, J. Phys. B: At. Mol. Opt. Phys. **41**, 195203(1–6).
52. M. F. Ciappina, M. Schulz, T. Kirchner, D. Fischer, R. Moshhammer, and J. Ullrich 2008, *Double ionization of helium by ion impact analyzed using four-body Dalitz plots*, Phys. Rev. A **77**, 062706(1–12).
53. D. Strohschein, D. Röhrbein, T. Kirchner, S. Fritzsche, J. Baran, and J. A. Tanis 2008, *Nonstatistical enhancement of the $1s2s2p^4P$ state in electron transfer in 0.5–1.0-MeV/u $C^{4,5+} + He$ collisions*, Phys. Rev. A **77**, 022706(1–7).
54. L. Gulyás, A. Igarashi, P. D. Fainstein, and T. Kirchner 2008, *Single and double ionization of helium: the axial symmetry*, J. Phys. B: At. Mol. Opt. Phys. **41**, 025202(1–9).
55. M. Zapukhlyak, T. Kirchner, A. Hasan, B. Tooke, and M. Schulz 2008, *Projectile angular-differential cross sections for transfer and transfer excitation in proton collisions with helium*, Phys. Rev. A **77**, 012720(1–9).
56. T. Kirchner 2007, *Laser-field enhanced electron transfer in p-Ne and p-Ar collisions*, Phys. Rev. A **75**, 025401(1–4).

57. T. Spranger, M. Zapukhlyak, and T. Kirchner 2007, *Angular differential cross sections for multiple ionisation of rare gas atoms by protons with inclusion of Auger-like processes*, J. Phys. B: At. Mol. Opt. Phys. **40**, 1081–1088.
58. L. Gulyás, A. Igarashi, and T. Kirchner 2006, *Double ionization of helium by fast ion impact: Reexamination of the correlation function*, Phys. Rev. A **74**, 032713(1–9).
59. A. Hasan, B. Tooke, M. Zapukhlyak, T. Kirchner, and M. Schulz 2006, *Kinematically complete experiment on transfer-excitation in intermediate energy p+He collisions*, Phys. Rev. A **74**, 032703(1–5).
60. T. Kirchner, H. Tawara, I. J. Tolstihina, A. D. Ulanstev, V. P. Shevelko, and T. Stöhlker 2006, *Many-electron ionization of atoms by fast ions: normalized exponent approximation*, J. Technical Physics **76**(9), 22–30.
61. M. Keim, A. Werner, D. Hasselkamp, K. -H. Scharfner, H. J. Lüdde, A. Achenbach, and T. Kirchner 2005, *Lyman- α polarisation after proton impact on atomic hydrogen*, J. Phys. B: At. Mol. Opt. Phys. **38**, 4045–55.
62. S. Knoop, M. Keim, H. J. Lüdde, T. Kirchner, R. Morgenstern, and R. Hoekstra 2005, *State selective single-electron capture in O^{6+} -Na collisions*, J. Phys. B: At. Mol. Opt. Phys. **38**, 3163–3172.
63. T. Kirchner, A. C. F. Santos, H. Luna, M. M. Sant’Anna, W. S. Melo, G. M. Sigaud, and E. C. Montenegro 2005, *Charge-state correlated cross sections for electron loss, capture, and ionization in C^{3+} -Ne collisions*, Phys. Rev. A. **72**, 012707(1–8).
64. M. Zapukhlyak, T. Kirchner, H. J. Lüdde, S. Knoop, R. Morgenstern, and R. Hoekstra 2005, *Inner- and outer-shell electron dynamics in proton collisions with sodium atoms*, J. Phys. B: At. Mol. Opt. Phys. **38**, 2353–2369.
65. H. Bräuning, R. Trassl, A. Theiß, A. Diehl, E. Salzborn, M. Keim, A. Achenbach, H. J. Lüdde, and T. Kirchner 2005, *Charge transfer in $Li^{2+} + He^{2+}$ and $Li^{2+} + Li^{3+}$ collisions*, J. Phys. B: At. Mol. Opt. Phys. **38**, 2311–2317.
66. T. Spranger and T. Kirchner 2004, *Auger-like processes in multiple ionization of noble gas atoms by protons*, J. Phys. B: At. Mol. Opt. Phys. **37**, 4159–4165.
67. L. Gulyás and T. Kirchner 2004, *Ionization of Ar by energetic proton impact*, Phys. Rev. A **70**, 022704(1–7).
68. T. Kirchner 2004, *Laser-field-induced modifications of electron-transfer processes in ion-atom collisions*, Phys. Rev A **69**, 063412(1–7).
69. T. Kirchner, M. Horbatsch, and H. J. Lüdde 2004, *Coupled mean-field description of electron removal processes in He^+ -Ne and He^+ -Ar collisions*, J. Phys. B: At. Mol. Opt. Phys. **37**, 2379–2385.
70. J. A. Tanis, A. L. Landers, D. J. Pole, A. S. Alnaser, S. Hossain, and T. Kirchner 2004, *Evidence for Pauli exchange leading to excited-state enhancement in electron transfer*, Phys. Rev. Lett. **92**, 133201(1–4).

71. T. Kirchner, M. Horbatsch, M. Keim, and H. J. Lüdde 2004, *State-selective electron capture calculations for p-Ar collisions in an independent many-electron model*, Phys. Rev. A. **69**, 012708(1–8).
72. M. Keim, A. Achenbach, H. J. Lüdde, and T. Kirchner 2003, *Microscopic response effects in collisions of antiprotons with helium atoms and lithium ions*, Phys. Rev. A. **67**, 062711(1–6).
73. T. Kirchner, M. Horbatsch, and H. J. Lüdde 2002, *Time-dependent independent particle model calculation of multiple capture and ionization processes in p-Ar, \bar{p} -Ar, and He^{2+} -Ar collisions*, Phys. Rev. A **66**, 052719(1–12).
74. T. Kirchner 2002, *Manipulating ion-atom collisions with coherent electromagnetic radiation*, Phys. Rev. Lett. **89**, 093203(1–4).
75. T. Kirchner, L. Gulyás, M. Schulz, R. Moshhammer, and J. Ullrich 2002, *Doubly differential electron emission spectra in single and multiple ionization of noble gas atoms by fast highly-charged ion impact*, Phys. Rev. A. **65**, 042727(1–9).
76. T. Kirchner, M. Horbatsch, E. Wagner, and H. J. Lüdde 2002, *Modeling of polarization and correlation effects in the ionization of helium by antiprotons*, J. Phys. B: At. Mol. Opt. Phys. **35**, 925–934.
77. T. Kirchner, M. Horbatsch, and H. J. Lüdde 2001, *Nonperturbative calculation of charge-changing processes in C^{4+} scattering from neon atoms*, Phys. Rev. A **64**, 012711(1–10).
78. T. Kirchner and M. Horbatsch 2001, *Nonperturbative calculation of projectile electron loss, target ionization, and capture in $He^+ + Ne$ collisions*, Phys. Rev. A **63**, 062718(1–12).
79. T. Kirchner, M. Horbatsch, H. J. Lüdde, and R. M. Dreizler 2000, *Time-dependent screening effects in ion-atom collisions with many active electrons*, Phys. Rev. A **62**, 042704(1–13).
80. L. Gulyás, T. Kirchner, T. Shirai, and M. Horbatsch 2000, *Origin of structures in the low-energy single-electron continuum in calculations for ion collisions from argon*, Phys. Rev. A **62**, 022702(1–5).
81. T. Kirchner, H. J. Lüdde, M. Horbatsch, and R. M. Dreizler 2000, *Quantum mechanical description of ionization, capture, and excitation in proton collisions with atomic oxygen*, Phys. Rev. A **61**, 052710(1–16).
82. T. Kirchner, H. J. Lüdde, and R. M. Dreizler 2000, *Effective single-particle description of single and multiple processes in $p^\pm + Ne$ collisions*, Phys. Rev. A **61**, 012705(1–8).
83. O. J. Kroneisen, H. J. Lüdde, T. Kirchner, and R. M. Dreizler 1999, *The basis generator method: optimized dynamical representation of the solution of time-dependent quantum problems*, J. Phys. A: Math. Gen. **32**, 2141–2156.

84. D. Elizaga, L. F. Errea, J. D. Gorfinkiel, C. Illescas, L. Méndez, A. Riera, A. Rojas, A. Macías, O. J. Kroneisen, T. Kirchner, H. J. Lüdde, A. Henne, and R. M. Dreizler 1999, *Theoretical analysis of electron capture and electron-loss in $Be^{4+} + H_2$ and $H^+ + H_2$ collisions*, J. Phys. B: At. Mol. Opt. Phys. **32**, 857–875.
85. T. Kirchner, L. Gulyás, H. J. Lüdde, E. Engel, and R. M. Dreizler 1998, *Influence of electronic exchange on single and multiple processes in collisions between bare ions and noble-gas atoms*, Phys. Rev. A **58**, 2063–2076.
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87. H. J. Lüdde, A. Henne, T. Kirchner, and R. M. Dreizler 1996, *Optimized dynamical representation of the solution of time-dependent quantum problems*, J. Phys. B: At. Mol. Opt. Phys. **29**, 4423–4441.

Papers in Conference Proceedings (invited and/or refereed)

88. M. D. Śpiewanowski, L. Gulyás, M. Horbatsch, J. Goullon, N. Ferreira, R. Hubele, V. L. B. de Jesus, H. Lindenblatt, K. Schneider, M. Schulz, M. Schuricke, Z. Song, S. Zhang, D. Fischer, and T. Kirchner 2015, *Target electron ionization in Li^{2+} - Li collisions: A multi-electron perspective*, J. Phys.: Conference Series **601**, 012010(1–8).
89. A. Salehzadeh and T. Kirchner 2015, *Electron removal processes in proton-methane collisions*, Phys. Procedia **66**, 16–21.
90. G. Schenk and T. Kirchner 2015, *Bare- and dressed-ion impact collisions from neon atoms studied within a nonperturbative mean-field approach*, Phys. Procedia **66**, 22–27.
91. T. Kirchner, M. Murakami, M. Horbatsch, and H. J. Lüdde 2012, *Calculations for charge transfer and ionization in heavy-particle collisions from water molecules*, J. Phys.: Conference Series **388**, 012038(1–8).
92. M. Zapukhlyak, N. Henkel, and T. Kirchner 2010, *Projectile scattering and electron-electron interaction in ion-atom collisions*, J. Phys.: Conference Series **212**, 012030(1–6).
93. M. Schulz, R. Moshhammer, D. Fischer, M. Dürr, J. Ullrich, A. Hasan, M. F. Ciappina, and T. Kirchner 2009, *Current status of kinematically complete studies of basic fragmentation processes in atomic systems*, Nucl. Instr. and Meth. in Phys. Res. B. **267**, 187–191.
94. M. Keim, A. Achenbach, H. J. Lüdde, and T. Kirchner 2005, *Time-dependent density functional theory calculations for collisions of bare ions with helium*, Nucl. Instr. and Meth. in Phys. Res. B. **233**, 240–243.
95. T. Kirchner 2005, *Pauli blocking and laser manipulation of the electron dynamics in atomic collisions*, Nucl. Instr. and Meth. in Phys. Res. B. **233**, 151–156.

96. T. Kirchner, H. J. Lüdde, and M. Horbatsch 2004, *Nonperturbative study of the rearrangement dynamics in ion-atom collisions with active electrons on projectile and target*, Physica Scripta **T110**, 364–369 (Proceedings of the XXIII. International Conference on Photonic, Electronic, and Atomic Collisions).
97. T. Kirchner, L. Gulyás, R. Moshhammer, M. Schulz, and J. Ullrich 2003, *Correlation effects in differential electron-emission spectra obtained from double ionization of He by fast Au⁵³⁺ impact*, Nucl. Instr. and Meth. in Phys. Res. B **205**, 479–483.
98. H. J. Lüdde, T. Kirchner, and M. Horbatsch 2002, *Quantum mechanical treatment of ion collisions with many-electron atoms*, in: *Photonic, Electronic, and Atomic Collisions*, edited by J. Burgdörfer *et al.* (Rinton Press, Princeton 2002), 708–719.
99. D. Skiera, R. Trassl, K. Huber, H. Bräuning, E. Salzborn, M. Keim, A. Achenbach, T. Kirchner, H. J. Lüdde, and R. M. Dreizler 2001, *Charge-changing processes in collisions between Li-like ions and He²⁺*, Physica Scripta **T92**, 423–425.
100. T. Kirchner and L. Gulyás 2001, *Differential net- and multiple-ionization cross sections in fast highly-charged ion collisions with atoms*, Physica Scripta **T92**, 348–350.
101. T. Kirchner, H. J. Lüdde, and R. M. Dreizler 1999, *Many electron dynamics in collisions between highly charged ions and neon atoms*, Physica Scripta **T80**, 416–417.
102. T. Kirchner, M. Keim, A. Achenbach, H. J. Lüdde, O. J. Kroneisen, and R. M. Dreizler 1999, *Basis generator method study of collisions between alpha particles and lithium-like ions*, Physica Scripta **T80**, 270–271.
103. T. Kirchner, H. J. Lüdde, O. J. Kroneisen, and R. M. Dreizler 1999, *New trends in the description of ion-atom collisions by time-dependent quantum methods*, Nucl. Instr. and Meth. in Phys. Res. B **154**, 46–53.

2a) Publications forthcoming

1. T. Kirchner 2019, *Ion-atom and atom-atom collisions*, in: *Springer Handbook of Atomic, Molecular, and Optical Physics*, second edition, edited by G. W. F. Drake (Springer Science+Business Media, New York 2019).
2. T. Kirchner 2019, *Collisions with antiprotons*, in: *Ion-atom collisions: The Few-Body Problem in Dynamic Systems*, edited by M. Schulz (De Gruyter, Berlin 2019).

3. Work Submitted

1. H. J. Lüdde, M. Horbatsch, and T. Kirchner 2019, *Electron capture and ionization cross-section calculations for proton collisions with methane and the DNA and RNA nucleobases*, submitted to Eur. Phys. J. D.
2. A. C. K. Leung and T. Kirchner 2019, *Proton impact on ground and excited states of atomic hydrogen*, submitted to Eur. Phys. J. D.

4. Colloquia and Invited Talks

1. *An independent-atom-model-based description of ion collisions with complex biomolecules*
May 29, 2019, Milwaukee, Wisconsin, USA (invited talk at the *2019 Meeting of the Division of Atomic, Molecular, and Optical Physics (DAMOP)* of the American Physical Society)
2. *Single- and multiple-particle dynamics in three-electron ion-atom collision systems*
August 3, 2017, Palm Cove, Queensland, Australia (invited talk at the *International Symposium on (e,2e), Double Photoionization and Related Topics and the 19th International Symposium on Polarization and Correlation in Electronic and Atomic Collisions*)
3. *Calculations for ionisation and capture processes in ion-molecule collisions: from relatively small to rather big systems*
July 24, 2017, Palm Cove, Queensland, Australia (invited talk at the *25th International Symposium on Ion-Atom Collisions (ISIAC 25)*)
4. *Shedding light on few-body quantum dynamics by studying atomic collisions*
February 24, 2017, University of Toronto, Toronto, Ontario (QO/AMO Seminar)
5. *Basis Generator Method Calculations for charge-transfer collisions involving few-electron systems*
December 20, 2016, Vienna, Austria (invited talk at the *IAEA Technical Meeting on Uncertainty Assessment and Benchmark Experiments for Atomic and Molecular Data for Fusion Applications*)
6. *Many-electron dynamics in ion collisions*
June 27, 2016, Neunkirchen, Germany (invited talk at the *Workshop on Structure and Dynamics of Atoms and Molecules*)
7. *Shedding light on few-body quantum dynamics by studying atomic collisions*
October 28, 2015, McMaster University, Hamilton, Ontario (Departmental Colloquium)
8. *An independent-atom-model description of ion-molecule collisions including geometric screening corrections*
October 16, 2015, Honolulu, Hawaii, USA (invited talk at the *68th Annual Gaseous Electronics Conference (GEC)*)
9. *Shedding light on few-body quantum dynamics by studying atomic collisions*
September 29, 2015, Brock University, Saint Catharines, Ontario (Departmental Seminar)
10. *Shedding light on few-body quantum dynamics by studying atomic collisions*
September 8, 2015, Old Dominion University, Norfolk, Virginia, USA (Departmental Colloquium)
11. *A theoretical analysis of recent ion-lithium collision experiments: single-active-electron, independent-electron, and, perhaps, correlated-electron dynamics*
October 28, 2014, York University Toronto, Ontario (Departmental Colloquium)

12. *Excitation-ionization of lithium atoms by fast ion impact: what the independent-electron model does and does not explain*
 July 18, 2014, Metz, France (invited talk at the *International Conference on Many Particle Spectroscopy of Atoms, Molecules, Clusters & Surfaces* (MPS 2014))
13. *Interaction of antiprotons and protons with atoms: a density-functional theory perspective*
 July 11, 2014, Bratislava, Slovakia (invited talk at the *6th Conference on Elementary Processes in Atomic Systems* (CEPAS 2014))
14. *Heavy-particle collisions involving many active electrons: how (in-)accurate are our calculated cross sections?*
 July 7, 2014, Cambridge, Massachusetts, USA (invited talk at the *Joint IAEA-ITAMP Technical Meeting on Uncertainty Assessment for Theoretical Atomic and Molecular Scattering Data*)
15. *Ion-molecule collisions studied with a combination of a microscopic collision calculation and a semi-phenomenological fragmentation model*
 July 20, 2013, Beijing, China (invited talk at the *23rd International Symposium on Ion-Atom Collisions* (ISIAC 23))
16. *Ionization and fragmentation of complex molecules studied with a density functional theory based approach*
 June 7, 2013, Quebec City, Quebec (invited talk at the *2013 Meeting of the Division of Atomic, Molecular, and Optical Physics* (DAMOP) of the American Physical Society (jointly held with the Canadian Association of Physicists' Division of Atomic, Molecular & Optical Physics))
17. *Calculations for charge transfer and ionization in heavy-particle collisions from water molecules*
 August 1, 2011, Belfast, Northern Ireland, UK (invited progress report at the *XXVII International Conference on Photonic, Electronic, and Atomic Collisions* (XXVII ICPEAC))
18. *Calculations of fast ion collisions with multi-center molecular targets*
 June 15, 2011, Atlanta, Georgia, USA (invited talk at the *2011 Meeting of the Division of Atomic, Molecular, and Optical Physics* (DAMOP) of the American Physical Society)
19. *Current status of antiproton impact ionization of atoms and molecules*
 April 29, 2011, Vancouver, British Columbia (invited talk at the *10th International Conference on Low Energy Antiproton Physics* (LEAP 2011))
20. *Multiple processes in highly-charged-ion collisions*
 August 30, 2010, Shanghai, China (invited talk at the *15th International Conference on the Physics of Highly Charged Ions* (HCI 2010))
21. *Collision-induced quantum dynamics: from atoms to molecules*
 August 21, 2010, Physikzentrum Bad Honnef, Germany (invited talk at the 463rd WE Heraeus Seminar *Ultrafast Atomic Physics — Towards the Zeptosecond Regime*)

22. *A nonperturbative quantum-mechanical approach to ion-molecule collisions*
August 10, 2010, Fort Worth, Texas, USA (invited talk at the *21st International Conference on the Application of Accelerators in Research and Industry (CAARI 2010)*)
23. *New calculations for heavy-particle collisions: more depth and complexity*
December 15, 2009, Kernfysisch Versneller Instituut, Atomic Physics, Rijksuniversiteit, Groningen, The Netherlands
24. *Projectile scattering and electron-electron interaction in ion-atom collisions*
August 1, 2009, Lexington, Kentucky, USA (invited talk at the *International Symposium on (e,2e), Double Photoionization and Related Topics*)
25. *A nonperturbative quantum mechanical approach to ion-molecule collisions*
July 20, 2009, Old Dominion University, Norfolk, Virginia, USA (invited talk at the *21st International Symposium on Ion-Atom Collisions (XXI ISIAC)*)
26. *Antiproton impact on atoms: new insights and persistent challenges*
January 21, 2009, Physikzentrum Bad Honnef, Germany (invited talk at the 426th WE Heraeus Seminar *Atomic Theory for Fundamental Interactions and Simple Systems in Strong Fields*)
27. *Atomic systems in time-dependent fields: persistent challenges, recent ideas, and new insights*
December 1, 2008, Humboldt Universität zu Berlin (Optics/Photonics Colloquium)
28. *Atomic systems in time-dependent fields: persistent challenges, recent ideas, and new insights*
April 1, 2008, York University Toronto, Ontario (Departmental Colloquium)
29. *Atomic systems in time-dependent fields: persistent challenges, recent ideas, and new insights*
February 28, 2008, Missouri University of Science and Technology, Rolla, Missouri, USA (Physics Colloquium)
30. *Laser- and collision-induced atomic dynamics: challenges for the quantum mechanical few-body and scattering theories*
November 23, 2007, Clausthal University of Technology, Germany (Colloquium on Mathematical Physics)
31. *Quantum mechanical calculations for multiple-electron loss of fast highly-charged ions in gas targets*
July 18, 2007, Gesellschaft für Schwerionenforschung (GSI), Darmstadt, Germany (invited talk at a *Theory Working Group Meeting*)
32. *A unified approach to collision- and laser-induced electron dynamics in atomic systems*
June 7, 2007, Max-Planck-Institut für die Physik komplexer Systeme, Dresden, Germany (seminar on ‘Atomic Physics’)

33. *Nonperturbative electron dynamics in field-free and laser-assisted atomic collisions*
October 2, 2006, Western Michigan University, Kalamazoo, Michigan, USA (Department Colloquium)
34. *Nonperturbative electron dynamics in field-free and laser-assisted atomic collisions*
September 7, 2006, University of Missouri-Rolla, Rolla, Missouri, USA (UMR Physics Colloquium)
35. *Nonperturbative electron dynamics in field-free and laser-assisted atomic collisions*
August 30, 2006, Kansas State University, Manhattan, Kansas, USA (Atomic Physics Seminar)
36. *Nonperturbative quantum dynamics in ultrafast atomic interactions*
August 23, 2006, Fort Worth, Texas, USA (invited talk at the *19th International Conference on the Application of Accelerators in Research and Industry* (CAARI 2006))
37. *Nonperturbative electron dynamics in (laser-assisted) atomic collisions*
April 11, 2006, York University Toronto, Ontario (Departmental Colloquium)
38. *Rearrangement dynamics in ion-atom collisions with active electrons on both centers*
January 11, 2006, Gesellschaft für Schwerionenforschung (GSI), Darmstadt, Germany (seminar on 'Atomic Physics')
39. *Multi-electron removal in ion-atom collisions*
July 28, 2005, Rio der Janeiro, Brasil (invited talk at the *19th International Seminar on Ion-Atom Collisions* (XIX ISIAC))
40. *Quantum dynamics of atomic few-body-systems: electron-electron interaction and laser manipulation*
May 11, 2005, colloquium of the Faculty of Natural and Materials Sciences, Clausthal University of Technology, Germany
41. *Electron transfer dynamics in laser-assisted collisions*
October 20, 2004, Max-Planck-Institut für Kernphysik, Heidelberg, Germany (Bothe-Seminar)
42. *Quantum dynamics of atomic few-body-systems: electron-electron interaction and laser manipulation*
October 18, 2004, Frankfurt University, Germany
43. *Pauli exchange effects in ion-atom collisions*
October 13, 2004, Fort Worth, Texas, USA (invited talk at the *18th International Conference on the Application of Accelerators in Research and Industry* (CAARI 2004))
44. *Pauli blocking and laser manipulation of the electron dynamics in atomic collisions*
September 3, 2004, Debrecen, Hungary (invited talk at the *8th Workshop on Fast Ion-Atom Collisions* (FIAC '04))

45. *Electron transfer dynamics in laser-assisted collisions*
June 24, 2004, Physikzentrum Bad Honnef, Germany (talk at the 329th WE Heraeus Seminar *Manipulation of Few-Body Quantum Dynamics*)
46. *Electron dynamics in laser-assisted atomic collisions*
March 22, 2004, Munich, Germany (invited talk in the symposium *Multifragment-Imaging-Dynamics in Many-Particle-Systems* at the spring meeting of the German Physical Society)
47. *Electron dynamics in laser-assisted atomic collisions*
February 5, 2004, Technical University Dresden, Germany (seminar on ‘Theoretical Physics’)
48. *Nonperturbative study of the rearrangement dynamics in ion-atom collisions with active electrons on projectile and target*
July 24, 2003, Stockholm, Sweden (invited progress report at the *XXIII International Conference on Photonic, Electronic, and Atomic Collisions* (XXIII ICPEAC))
49. *Electron transfer dynamics in laser-assisted collisions*
June 10, 2003, Kernfysisch Versneller Instituut, Atomic Physics, Rijksuniversiteit, Groningen, The Netherlands
50. *Coupled, time-dependent treatment of the electron transfer and ionization dynamics in field-free and laser-assisted ion-atom collisions*
May 21, 2003, Boulder, Colorado, USA (invited talk at the *2003 Meeting of the Division of Atomic, Molecular, and Optical Physics* (DAMOP) of the American Physical Society)
51. *Manipulating ion-atom collisions with coherent electromagnetic radiation*
December 12, 2002, Max-Planck-Institut für die Physik komplexer Systeme, Dresden, Germany (invited talk at the *International Workshop on Atomic Physics*)
52. *Time-dependent description of ion-impact and laser-field induced electron dynamics in atomic systems*
August 29, 2002, Clausthal University of Technology, Germany
53. *Ion-atom collisions in the presence of strong laser fields*
June 7, 2002, Physikzentrum Bad Honnef, Germany (invited talk at the 278th WE Heraeus Seminar *Highly Correlated States in Molecules, Atoms and Nuclei*)
54. *Manipulating ion-atom collisions with coherent electromagnetic radiation*
May 15, 2002, Max-Planck-Institut für die Physik komplexer Systeme, Dresden, Germany (seminar on ‘Atomic Physics’)
55. *Laser-assisted electron transfer and ionization in atomic collisions*
April 24, 2002, Max-Planck-Institut für Kernphysik, Heidelberg, Germany (Bothe-Seminar)
56. *Quantum mechanical study of an ion-atom collision within a laser field*
February 11, 2002, Frankfurt University, Germany (seminar on ‘New Aspects of Atomic Physics’)

57. *Quantum mechanical treatment of ion-atom collisions with many active electrons*
November 9, 2001, Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI), Debrecen, Hungary
58. *Ionization of atoms by protons and antiprotons*
September 14, 2001, Aarhus, Denmark (invited talk at the *Second International Workshop on Atomic Collisions and Atomic Spectroscopy with slow Antiprotons* (PBAR 01))
59. *Calculations for differential single and multiple ionization events in fast ion-atom collisions*
December 13, 2000, Freiburg University, Germany (group seminar of Prof. Dr. J. Ullrich)
60. *Quantum theoretical description of many-electron processes in ion-atom collisions*
June 11, 1999, Freiburg University, Germany (group seminar of Prof. Dr. J. Ullrich)
61. *New trends in the description of ion-atom collisions by time-dependent quantum methods*
September 9, 1998, Debrecen, Hungary (invited talk at the *7th Workshop on Fast Ion-Atom Collisions* (FIAC '98))
62. *Quantum effects in collisions between ions and noble gas atoms*
November 18, 1997, Gesellschaft für Schwerionenforschung (GSI) Darmstadt, Germany (seminar on 'Theoretical and Experimental Heavy Ion Physics')
63. *Many-particle processes in collisions between ions and complex noble gas atoms*
February 3, 1997, Frankfurt University, Germany (seminar on 'New Aspects of Atomic Physics')

5. Professional Service

Ongoing

- Chair of the Local Organizing Committee of the *32nd International Conference on Photonic, Electronic and Atomic Collisions* (ICPEAC XXXII) to be held in Ottawa, Ontario, July 20–27, 2021
- Member of the Editorial Board of *Physical Review A* (since Jan 1, 2017)
- Past Chair of the Executive Committee of the *Gaseous Electronics Conference* (GEC) (since Nov. 2018) after serving as Chair for two years and Chair-Elect for one year

Completed

- Chair-line of the *Topical Group on Few-Body Systems & Multiparticle Dynamics* of the American Physical Society, serving as Past Chair in 2018/2019, Chair in 2017/2018, Chair-Elect in 2016/2017 and Vice Chair in 2015/2016
- Treasurer of the *Gaseous Electronics Conference* (GEC) (2010–2014)
- Co-chair of the *20th International Symposium on Ion-Atom Collisions* (XX ISIAC), Crete (2007)

- Co-organizer of the 329th Wilhelm und Else Heraeus Seminar *Manipulation of Few-Body Quantum Dynamics*, June 23–26, 2004, Bad Honnef, Germany

6. Funding

Title (Role)	Institution	Amount	Duration
Collision- and laser-induced few-body dynamics in atomic and molecular systems (Discovery Grant, PI)	Natural Sciences and Engineering Research Council of Canada	\$ 140,000	5 years since 04/19
Collision-induced few-body dynamics of atomic and molecular systems (Discovery Grant, PI)	Natural Sciences and Engineering Research Council of Canada	\$ 155,000	04/14–03/19
Junior Faculty Fund (PI)	Faculty of Science and Engineering, York University	c. \$ 900	2012
Junior Faculty Fund (PI)	Faculty of Science and Engineering, York University	c. \$ 1000	2011
Junior Faculty Fund (PI)	Faculty of Science and Engineering, York University	c. \$ 600	2010
Junior Faculty Fund (PI)	Faculty of Science and Engineering, York University	c. \$ 400	2009
Collision- and laser-induced quantum dynamics of atomic and molecular systems (Discovery Grant, PI)	Natural Sciences and Engineering Research Council of Canada	\$ 205,000	04/09–03/14
Computing cluster for calculations on collision- and laser-induced quantum dynamics of atomic and molecular systems (RTI Grant, PI)	Natural Sciences and Engineering Research Council of Canada	c. \$ 24,000	04/09–03/11
Nonperturbative, quantum-mechanical description of charge-changing processes in fast heavy-particle collisions from gas targets (PI)	Federal Ministry for Education and Research (Germany)	c. 95000 EUR	09/06–06/09
Theory of laser-assisted and laser-induced processes in few-electron atomic and molecular systems (PI)	German Research Foundation (DFG)	c. 234000 EUR	10/05–11/08
Nonperturbative description of the electron dynamics of atomic systems in laser- and ion-generated time-dependent fields (PI)	German Research Foundation (DFG)	c. 79000 EUR	10/03–09/06

C. Teaching

1. Summary of Teaching

I taught my first two courses as course director in the academic year 2000/2001 while being a postdoctoral fellow at York University. Later, teaching was an integral part of my duties as Juniorprofessor at Clausthal University of Technology (2003–2009). I taught courses at both undergraduate and graduate levels (i.e., for students before and after the German ‘Vordiplom’) on a number of different subjects, including core courses on Classical Mechanics, Classical Electrodynamics, and Quantum Mechanics.

Since my arrival at York as a faculty member in April 2009 I have taught three purely undergraduate courses (PHYS 1410, PHYS 3010, PHYS 4010), one integrated undergraduate/graduate course (PHYS 4011/5050), which is listed only as an undergraduate course below, one graduate core course (PHYS 5000), and two graduate mini-courses (PHYS 6204 and PHYS 6208). The latter two were new courses that I developed. I have taught all other (three-credit) courses multiple times.

Since Fall 2018 I have taught PHYS 5000 and PHYS 4011/5050 in an online setting. Both courses are part of an articulation agreement called “Ontario Physics Education Network” (OPEN) between the physics (and astronomy) departments of the University of Windsor (lead institution), Trent University, and York University. OPEN enables graduate students at all three partner institutions to take courses offered online at Windsor, Trent, and York, thus increasing their choice of courses and creating flexible program pathways. The main feature of these OPEN courses is their live delivery via web conferencing software. OPEN is funded by eCampus Ontario. York’s portion of the grant was \$92,716 (plus 2% overhead) to be spent for salaries, equipment, and media production and instructional design. I have been the PI of this subgrant.

2. Undergraduate courses taught at York University (since 2009)

Winter 2019	<i>Atomic and Molecular Physics</i> (PHYS 4011/5050 3.0)
Winter 2018	<i>Classical Mechanics</i> (PHYS 3010 3.0)
Fall 2015	<i>Quantum Mechanics</i> (PHYS 4010 3.0)
Winter 2015	<i>Classical Mechanics</i> (PHYS 3010 3.0)
Fall 2014	<i>Quantum Mechanics</i> (PHYS 4010 3.0)
FW 2013/2014	Sabbatical
Winter 2013	<i>Atomic and Molecular Physics</i> (PHYS 4011/5050 3.0)
Winter 2013	<i>Classical Mechanics</i> (PHYS 3010 3.0)
Fall 2012	<i>Physical Science</i> (PHYS 1410 6.0); fall term only
Winter 2012	<i>Atomic and Molecular Physics</i> (PHYS 4011/5050 3.0)
Winter 2012	<i>Classical Mechanics</i> (PHYS 3010 3.0)
Fall 2011	<i>Physical Science</i> (PHYS 1410 6.0); fall term only
Winter 2011	<i>Atomic and Molecular Physics</i> (PHYS 4011/5050 3.0)
Winter 2011	<i>Classical Mechanics</i> (PHYS 3010 3.0)
Summer 2010	<i>Physical Science</i> (PHYS 1410 6.0)
Winter 2010	<i>Atomic and Molecular Physics</i> (PHYS 4011/5050 3.0)
Winter 2010	<i>Classical Mechanics</i> (PHYS 3010 3.0)
Fall 2009	Tutorials in <i>Physical Science</i> (PHYS 1419)

3. Graduate courses taught at York University (since 2009)

Fall 2018	<i>Quantum Mechanics I</i> (PHYS 5000 3.0)
Fall 2017	<i>Quantum Mechanics I</i> (PHYS 5000 3.0)
Fall 2016	<i>Quantum Mechanics I</i> (PHYS 5000 3.0)
Winter 2016	<i>Elements of Quantum Scattering Theory</i> (PHYS 6204 1.0)
Fall 2015	<i>Quantum Mechanics I</i> (PHYS 5000 3.0)
Winter 2015	<i>Topics in Atom/Molecule-Laser Interactions</i> (PHYS 6208 1.0)
Fall 2014	<i>Quantum Mechanics I</i> (PHYS 5000 3.0)

4. Courses taught at Clausthal University of Technology (2003–2009)

Winter 2008/2009	<i>Theoretical Physics I: Classical Mechanics</i>
Summer 2008	<i>Theoretical Physics II: Classical Electrodynamics</i>
Summer 2007	<i>Theoretical Physics II: Classical Electrodynamics</i>
Winter 2006/2007	<i>Theoretical Physics III: Quantum Mechanics</i>
Summer 2006	<i>Quantum Theory of the Chemical Bond</i>
Winter 2005/2006	<i>Theoretical Physics I: Classical Mechanics</i>
Summer 2005	<i>Dynamics and Interactions of Elementary Quantum Systems</i>
Winter 2004/2005	<i>Theoretical Physics III: Quantum Mechanics</i>
Summer 2004	<i>Electronic Structure of Molecules</i>
Winter 2003/2004	<i>Theoretical Physics III: Quantum Mechanics</i>
Summer 2003	<i>Dynamics and Interactions of Elementary Quantum Systems</i>

5. Previous Teaching Activities

Summer 2002	Tutorial leader for the course <i>Atomic, Molecular, Optical, and Environmental Physics</i> at the R.-Karls-Universität, Heidelberg, Germany
Winter 2001	<i>Atomic and Molecular Physics</i> (PHYS 4011/5050 3.0) at the Department of Physics and Astronomy, York University, Toronto, Ontario, Canada (course director)
Fall 2000	<i>Signal and Communications Theory</i> (PHYS 4250 3.0) at the Department of Physics and Astronomy, York University, Toronto, Ontario, Canada (course director)
1995 – 1999	Teaching Assistant at the Institut für Theoretische Physik, Goethe-Universität Frankfurt a.M., Germany. My main responsibility was to teach tutorial sessions for <i>Classical Mechanics, Electrodynamics, Quantum Mechanics I and II, Thermodynamics and Statistics</i>
1993 – 1995	Student Tutor at the Institut für Theoretische Physik, Goethe-Universität Frankfurt a.M., Germany for <i>Classical Mechanics</i>

6. Postdoctoral and Student Supervision

Since my arrival at York in 2009 I have supervised four York undergraduate students, four international (exchange) summer students, two M.Sc. (thesis) students, and four Ph.D. students (one of whom withdrew from the Program before completion). In addition, I have been a member of eleven graduate student supervisory committees and have participated in 16 thesis or dissertation defences (in eight of them as Chair and in two of them as External Member). I have co-supervised three postdocs.

As Juniorprofessor at Clausthal University of Technology I supervised one postdoc, three Ph.D. students (one dissertation has remained incomplete) and nine M.Sc. (German “Diplom”) students as principal supervisor. I acted as external examiner of one Ph.D. thesis in The Netherlands (in 2006).

D. Service

1. Professional Academic and Service Activities at York University

Ongoing

- Director of the Graduate Program in Physics and Astronomy and Member of the Executive Committee of the Department of Physics and Astronomy (since January 2016)
- Chair of the departmental Leadership Search Committee (since September 2019)

Completed

- Affirmative Action Representative on Full Time Tenure Stream - Assistant Professor in Theoretical Physics Search Committee of the Department of Physics and Astronomy (2018/2019)
- Faculty sponsor of the Physics Society in York (undergraduate student club) (2012–2019)
- Member of the Senate Committee on Tenure & Promotions (September 2016 to December 2017)
- Member of an NSERC/OGS Doctoral Award Adjudication Committee of the Faculty of Graduate Studies (November 2017)
- Member of a Vanier Scholarship Application Review Committee of the Faculty of Graduate Studies (September 2017)
- Representative of the Department of Physics and Astronomy at the York Science Open House event (March 2017)
- Member of an CGS-M/OGS Masters Award Adjudication Committee of the Faculty of Graduate Studies (March 2017)
- Member of an NSERC/OGS Doctoral Award Adjudication Committee of the Faculty of Graduate Studies (November 2016)
- Chair of the Adjudicating Committee of the Department of Physics and Astronomy for a file for Advancement from Pre-Candidacy to Candidacy I (September 2016)
- Member of a CGS-M/OGS Masters Award Adjudication Committee of the Faculty of Graduate Studies (March 2016)
- Representative of the Department of Physics and Astronomy at the Fall Campus Day (November 2015)
- Member of the First Year Integrated Science Committee of the Faculty of Science (FW 2015/2016)
- Website Committee of the Department of Physics and Astronomy (FW 2014/15)

- Affirmative Action Representative on Full Time Alternate Stream - Assistant Lecturer Search Committee of the Department of Physics and Astronomy (2015)
- Representative of the Department of Physics and Astronomy at Ontario Universities' Fair (September 2014)
- Member of the Tenure & Promotions Committee of the Faculty of Science (2014/15)
- Chair of the Adjudicating Committee of the Department of Physics and Astronomy for a file for Promotion to Associate Professor with Tenure (2012/13)
- Member of the File Preparation Committee of the Department of Physics and Astronomy for a file for Promotion to Associate Professor with Tenure (2012/13)
- Member of the Faculty of Science and Engineering Merit Exercise Committee (2012)
- Organizer of the Departmental Colloquium of the Department of Physics and Astronomy (2010–2013)
- Representative of the Department of Physics and Astronomy at the Fall Campus Day (November 2010)
- Judge of the Fermi Question Event at the York Engineering and Science (YES) Olympics (April 2010)
- Member of the Committee on Admissions and Recruitment of the Faculty of Science and Engineering (2009–2012)
- Member of the Curriculum Committee of the Department of Physics and Astronomy (2009–2010)

2. Further Professional Activities

Ongoing

- Member of the Executive Committee of the *International Conference on Photonic, Electronic, and Atomic Collisions* (ICPEAC) (since 2013)
- Member of the International Advisory Board of the *International Conference on Many Particle Spectroscopy of Atoms, Molecules, Clusters & Surfaces* (MPS) (since 2013)
- Participant in the International Atomic Energy Agency (IAEA) Coordinated Research Project F43023 *Data for Atomic Processes Related to Neutral Beams in Fusion Plasma* (since 2017)
- "Friend of" the Canadian Association of Physicists (CAP) (since 2012)
- Member of the Scientific Committee of the *International Symposium on (e,2e), Double Photoionization and Related Topics* (since 2009)

- Referee for *Atomic Data and Nuclear Data Tables*, *Atoms*, *Computer Physics Communications*, *European Journal of Physics D*, *Few-Body Systems*, *Hyperfine Interactions*, *Journal of Atomic, Molecular, and Optical Physics*, *Journal of the Optical Society of America B*, *Journal of Physics B*, *Journal of Physics and Chemistry of Solids*, *Journal of Quantitative Spectroscopy and Radiative Transfer*, *Nature Communications*, *Nuclear Instruments and Methods B*, *Physical Review A und Letters*, *Physics Letters A*, *Physics Research International*, *PhysMath Central (PMC) Physics B*, *Plasma Sources Science and Technology*

Completed

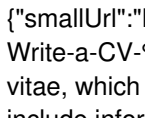
- Guest editor (together with Dr. Michael Schulz, Missouri University of Science & Technology) of the special issue *Recent Advances in Ion-Impact Atomic Collisions: Experiment, Theory, and Applications* published in *Atoms* (2018/2019)
- Guest editor (together with three colleagues) of a special issue dedicated to the *71st Gaseous Electronics Conference* published in *Journal of Physics B* and *Plasma Sources Science and Technology* (2019)
- Guest editor (together with four colleagues) of a special issue dedicated to the *70th Gaseous Electronics Conference* published in *Journal of Physics B* and *Plasma Sources Science and Technology* (2018)
- Invited participant in an International Atomic Energy Agency (IAEA) Consultants' Meeting on *Data Evaluation for Heavy Particle Collision Processes*, March 17–18, 2016, IAEA Headquarters, Vienna, Austria
- Member of the collaboration board of the *Stored Particles Atomic Physics Research Collaboration* (SPARC) (2007–2017)
- Member of the International Advisory Committee of the *International Symposium on Ion-Atom Collisions* (ISIAC) (2009–2015)
- Local organizer of the Programme Committee Meeting of the *International Conference on Photonic, Electronic, and Atomic Collisions* (ICPEAC), (Toronto, August 2014)
- Organizer and chairman of the session *Fundamental Processes in Atomic Physics* at the *23rd International Conference on the Application of Accelerators in Research and Industry* (CAARI 2014)
- Organizer and chairman of the session *Fundamental Processes in Collisions involving Molecules* at the *23rd International Conference on the Application of Accelerators in Research and Industry* (CAARI 2014)
- Organizer and chairman of the session *Highly-Charged Ions Colliding with Atoms or Molecular Systems* at the *22nd International Conference on the Application of Accelerators in Research and Industry* (CAARI 2012)
- Member of a selection panel of the Ontario Graduate Scholarship (OGS) Program (2010)

- Member of the Executive Committee of the *Gaseous Electronics Conference* (GEC) (2008–2010)
- Member of the academic senate of Clausthal University of Technology (2007–2008)
- Organizer and chairman of the session *Advances in Atomic Theory* at the *19th International Conference on the Application of Accelerators in Research and Industry* (CAARI 2006)
- Alternate member of the academic senate of Clausthal University of Technology (2005–2007)
- Member of the General Committee of the *International Conference on Photonic, Electronic, and Atomic Collisions* (ICPEAC) (2005-2009)
- Ad-hoc reviewer for the National Science Foundation (NSF), USA (2012, 2013, 2014, 2015, 2016, 2017, 2018)
- Ad-hoc reviewer for the Shota Rustaveli National Science Foundation, Georgia (2015)
- Ad-hoc reviewer for the Alexander von Humboldt Foundation, Germany (2008, 2011, 2012)
- Ad-hoc reviewer for the German Research Foundation (DFG), Germany (2008, 2011)
- Ad-hoc reviewer for the Department of Energy (DOE), USA (2004, 2007, 2010)

Memberships in professional societies

- Member of the American Physical Society (APS) (since 2010)
- Member of the Canadian Association of Physicists (CAP) (since 2010)
- Member of the German Physical Society (DPG) (since 1997)

Toronto, Ontario, October 7, 2019

Don't worry! Curriculum Vitae (CV) means "course of life" in Latin, and that is just what it is. A CV is a concise document which summarizes your past, existing professional skills, proficiency and experiences. The purpose of this document is to demonstrate that you have the necessary skills (and some complementary ones) to do the job for which you are applying.  A CV (short for the Latin phrase curriculum vitae, which means "course of life") is a detailed document highlighting your professional and academic history. CVs typically include information like work experience, achievements and awards, scholarships or grants you've earned, coursework, research projects and publications of your work. You may be asked to submit a CV when applying for jobs in academia or a job outside the US. If you need help determining how to write a CV, it can be helpful to consult a template. In this article, we will provide additional background on the document along with CURRICULUM VITAE "Mikhail Portnoi" University of Exeter. and Applied Nano-Electromagnetics II (THz Circuits, Materials, Devices), edited by A.Maffucci and S.A.Maksimenko, NATO Science for Peace and Security Series B: Physics and Biophysics (Springer, Dordrecht, 2019), Chapter 11, pp. 201-214. DOI: https://doi.org/10.1007/978-94-024-1687-9_11. Curriculum Vitae (CV) or resume builder for free on Curriculumvitae.net. Create your resume or CV online and share it using Curriculumvitae.net. Fast, easy and fun. We simplify how to make your resume or CV! Get started now! Easy, Professional and Fast Online Curriculum vitae Builder. Export your LinkedIn information into a beautiful Curriculum Vitae. Export, edit and share your Curriculum vitae in minutes. Build Your Curriculum vitae. Titan. IO. Tom Kurt Rainer Kirchner, Dr. phil. nat. (Frankfurt), Professor of Physics Department of Physics and Astronomy, York University, Toronto ON M3J 1P3 email: tomk@yorku.ca. 1. Degrees. 06/1999 07/1995. Dr. phil. nat. (summa cum laude), Institut für Theoretische Physik der Johann Wolfgang Goethe-Universität, Frankfurt a.M., Germany. Thesis (supervisor: Prof. Dr. R. M. Dreizler): "A quantum mechanical description of many-electron processes in ion-atom collisions" Diplom-Physiker (mit Auszeichnung), Johann Wolfgang Goethe-Universität, Frankfurt a.M., Germany.