

# PUBLICATIONS DR JEROEN C. J. KOELEMEIJ

## SUMMARY (FEBRUARY 23, 2016)

|                 | Google Scholar | Thomson Reuters Web of Science |
|-----------------|----------------|--------------------------------|
| Published items | 59             | 23                             |
| Citations       | 1490           | 864                            |
| h-index         | 15             | 11                             |
| i-10 index      | 20             | 14                             |

## SUBMITTED MANUSCRIPTS

- [1] J.-Ph. Karr, S. Patra, J.C.J. Koelemeij, J. Heinrich, N. Silitoe, A. Douillet, L. Hilico,  
“Hydrogen molecular ions: new schemes for metrology and fundamental physics tests,”  
8<sup>th</sup> Frequency Standards Symposium Conference proceedings (submitted)

## REFERRED PUBLICATIONS

- [26] V.I. Korobov, J.C.J. Koelemeij, L. Hilico, J.-Ph. Karr,  
“Test of the theoretical hyperfine structure of the molecular hydrogen ion at the 1-ppm level,”  
*Physical Review Letters* **116**, 053003 (2016).
- [25] E.F. Dierikx, A.E. Wallin, T. Fordell, J. Myyry, P. Koponen, M. Merimaa, T.J. Pinkert, J.C.J. Koelemeij, H. Peek, R. Smets,  
“White Rabbit Precision Time Protocol on Long Distance Fiber Links,”  
*IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, (accepted) (2016).
- [24] W. Ubachs, J.C.J. Koelemeij, K.S.E. Eikema, E.J. Salumbides,  
“Physics beyond the Standard Model from hydrogen spectroscopy,”  
*Journal of Molecular Spectroscopy* **320**, 1-12 (2016).
- [23] J. Biesheuvel, J.-Ph. Karr, L. Hilico, K.S.E. Eikema, W. Ubachs, J.C.J. Koelemeij,  
“Probing QED and fundamental constants through laser spectroscopy of vibrational transitions  
in HD<sup>+</sup>,”  
*Nature Communications* **7**, 10385 (2016).

- [22] T.J. Pinkert, O. Böll, L. Willmann, G.S.M. Jansen, E.A. Dijck, B.G.H.M. Groeneveld, R. Smets, F.C. Bosveld, W. Ubachs, K. Jungmann, K.S.E. Eikema, J.C.J. Koelemeij,  
 “Effect of soil temperature on optical frequency transfer through unidirectional dense-wavelength-division-multiplexing fiber-optic links,”  
*Applied Optics* **54**(4), 728-738 (2015).
- [21] J.C.J. Koelemeij,  
 “Forbidden vibrations,”  
*Nature Physics* **10**, 800-801 (2014).
- [20] N. Sotiropoulos, C.M. Okonkwo, R. Nuijts, H. de Waardt, J.C.J. Koelemeij,  
 “Delivering 10 Gb/s optical data with picosecond timing uncertainty over 75 km distance,”  
*Optics Express* **21**(26), 32643-32654 (2013).
- [19] V.Q. Tran, J.-Ph. Karr, A. Douillet, J.C.J. Koelemeij, L. Hilico,  
 “Two-photon spectroscopy of trapped HD<sup>+</sup> ions in the Lamb-Dicke regime,”  
*Physical Review A* **88**, 033421 (2013).
- [18] F.M.J. Cozijn, J. Biesheuvel, A.S. Flores, W. Ubachs, G. Blume, A. Wicht, K. Paschke, G. Erbert, J.C.J. Koelemeij,  
 “Laser cooling of beryllium ions using a frequency-doubled 626 nm diode laser,”  
*Optics Letters* **38**(13), 2370-2372 (2013).
- [17] E.J. Salumbides, J.C.J. Koelemeij, J. Komasa, K. Pachucki, K.S.E. Eikema, W. Ubachs,  
 “Bounds on fifth forces from precision measurements on molecules,”  
*Physical Review D* **87**, 112008 (2013).
- [16] J. Biesheuvel, D.W.E. Noom, E.J. Salumbides, K. T. Sheridan, W. Ubachs, J.C.J. Koelemeij,  
 “Widely tunable laser frequency offset lock with 30 GHz range and 5 THz offset,”  
*Optics Express* **21**(12), 14008-14016 (2013).
- [15] J.C.J. Koelemeij, D.W.E. Noom, D. de Jong, M.A. Haddad, W. Ubachs,  
 “Observation of  $\nu' = 8 - \nu = 0$  vibrational overtones in trapped HD<sup>+</sup> molecular ions,”  
*Applied Physics B: Lasers and Optics* **107**(4), 1075-1085 (2012).
- [14] J.C.J. Koelemeij,  
 “Infrared dynamic polarizability of HD<sup>+</sup> rovibrational states,”  
*Physical Chemistry Chemical Physics* **13**, 18844-18851 (2011).

- [13] A.L. Wolf, J. Morgenweg, J.C.J. Koelemeij, S.A. van den Berg, W. Ubachs, K.S.E. Eikema, "Direct frequency-comb spectroscopy of a dipole-forbidden clock transition in trapped  $^{40}\text{Ca}^+$  ions," *Optics Letters* **36**, 49 (2011).
- [12] C.-W. Chou, D.B. Hume, J.C.J. Koelemeij, D.J. Wineland, T. Rosenband, "Frequency comparison of two high-accuracy  $\text{Al}^+$  optical clocks," *Physical Review Letters* **104**, 070802 (2010).
- [11] J. Liu, E.J. Salumbides, U. Hollenstein, J.C.J. Koelemeij, K.S.E. Eikema, W. Ubachs, F. Merkt, "Determination of the ionization and dissociation energies of molecular hydrogen,  $\text{H}_2$ ," *Journal of Chemical Physics* **130**, 174306 (2009).
- [10] J.C.J. Koelemeij, B. Roth, S. Schiller, "Blackbody thermometry with cold molecular ions and application to ion-based frequency standards," *Physical Review A* **76**, 023413 (2007).
- [9] T. Rosenband, P.O. Schmidt, D.B. Hume, W.M. Itano, T.M. Fortier, J.E. Stalnaker, S.A. Diddams, J.C.J. Koelemeij, J.C. Bergquist, D.J. Wineland, "Observation of the  $^1\text{S}_0 - ^3\text{P}_0$  clock transition in  $^{27}\text{Al}^+$ ," *Physical Review Letters* **98**, 220801 (2007).
- [8] J.C.J. Koelemeij, B. Roth, A. Wicht, I. Ernsting, S. Schiller, "Vibrational spectroscopy of  $\text{HD}^+$  with 2-ppb accuracy," *Physical Review Letters* **98**, 173002 (2007).
- [7] B. Roth, J.C.J. Koelemeij, H. Daerr, S. Schiller, "Rovibrational spectroscopy of trapped molecular hydrogen molecules at millikelvin temperatures," *Physical Review A* **74**, 040501(R) (2006).
- [6] J.C.J. Koelemeij, W. Hogervorst, W. Vassen, "A high-power frequency-stabilized laser for cooling of metastable helium at 389 nm," *Review of Scientific Instruments* **76**, 033104 (2005).
- [5] J.C.J. Koelemeij, M. Leduc, "Prospects for measurement and control of the scattering length of metastable helium using photoassociation techniques," *European Physical Journal D* **31**, 263-271 (2004).

- [4] J.C.J. Koelemeij, A.S. Tychkov, T. Jeltes, W. Hogervorst, W. Vassen,  
“High densities and optical collisions in a two-color magneto-optical trap for metastable helium,”  
*Journal of Physics B: Atomic, Molecular and Optical Physics* **37**, 3501-3520 (2004).
- [3] A.S. Tychkov, J.C.J. Koelemeij, T. Jeltes, W. Hogervorst, W. Vassen,  
“Two-color magneto-optical trap for metastable helium,”  
*Physical Review A* **69**, 055401(R) (2004).
- [2] J.C.J. Koelemeij, R.J.W. Stas, W. Hogervorst, W. Vassen,  
“Magneto-optical trap for metastable helium at 389 nm,”  
*Physical Review A* **67**, 053406 (2003).
- [1] J.C.J. Koelemeij, A. de Lange, W. Ubachs,  
“Search for outer-well states above the ionization potential in H-2,”  
*Chemical Physics* **287**, 349-354 (2003).

## REFERRED CONFERENCE PAPERS

- [3] N. Sotiropoulos, C.M. Okonkwo, R. Nuijts, H. de Waardt, J.C.J. Koelemeij, “Simultaneous Delivery of Picosecond Time and 10 Gbps Data over 75 km Distance,” Precise Time and Time Interval and Applications Meeting, Bellevue, Washington, USA, December 2-5, 2013.
- [2] N. Sotiropoulos, C.M. Okonkwo, R. Nuijts, H. de Waardt, J.C.J. Koelemeij, “Delivering 10 Gb/s optical data with picosecond timing accuracy over 75 km distance,” Proceedings Symposium IEEE Photonics Society Benelux, Eindhoven, The Netherlands, November 25-26, 2013.
- [1] J.C.J. Koelemeij, T.J. Pinkert, K.S.E. Eikema, W. Ubachs, R. Nuijts, O. Böll, L. Willmann, K. Jungmann, “Putting optical fiber frequency links to work,” Terena Networking Conference, Reykjavik, May 21-24 2012.

## BOOK CONTRIBUTIONS, CONFERENCE PROCEEDINGS & MISCELLANEOUS

- [11] J.C.J. Koelemeij and M. Knoop, “Ultrahigh Vacuum for Trapped Ions,” pp xx-yy in M. Knoop, N. Madsen, R.C. Thompson (editors), *Physics with Trapped Charged Particles : A Graduate Textbook with Problems and Solutions*, Imperial College Press, London, to appear in 2016, ISBN 978-1-78634-011-5
- [10] Anne Lisa Wolf, Jonas Morgenweg, Jeroen Koelemeij, Steven van den Berg, Wim Ubachs, Kjeld Eikema, “Direct frequency-comb spectroscopy of a dipole-forbidden clock transition in trapped  $^{40}\text{Ca}^+$  ions,” European Quantum Electronics Conference Munich, Germany May 22, 2011, Frequency-Comb Spectroscopy and CEP Effects (EG3)

- [9] T. Rosenband, D.B. Hume, C.-W. Chou, J.C.J. Koelemeij, A. Brusch, S. Bickman, W. H. Oskay, T.M. Fortier, J.E. Stalnaker, S.A. Diddams, N.R. Newbury, W.C. Swann, W.M. Itano, D.J. Wineland, J.C. Bergquist, "Alpha-dot or not: comparison of two single atom optical clocks," *Proceedings 2008 Symposium on Frequency Standards and Metrology*, p. 20 (2008).
- [8] B. Roth, J. Koelemeij, S. Schiller, L. Hilico, J. -Ph. Karr, V. Korobov, D. Bakalov, "Precision Spectroscopy of Molecular Hydrogen Ions: Towards Frequency Metrology of Particle Masses," in "Precision Physics of Simple Atomic Systems," *Lecture Notes in Physics* **745**, 205-232, Springer (2008)
- [7] B. Roth, J. Koelemeij, H. Daerr, I. Ernsting, S. Jorgensen, M. Okhapkin, A. Wicht, A. Nevsky, S. Schiller, "Trapped Ultracold Molecular Ions: Candidates for an Optical Molecular Clock for a Fundamental Physics Mission in Space," in *Proceedings 6th International Conference on Space Optics, ESTEC, Noordwijk, The Netherlands*, ESA-SP 621 (2006)
- [6] D.J. Wineland, D. Leibfried, J.C. Bergquist, R.B. Blakestad, J.J. Bollinger, J. Britton, J. Chiaverini, R.J. Epstein, D.B. Hume, W.M. Itano, J.D. Jost, M. Knill, J.C.J. Koelemeij, C. Langer, R. Ozeri, R. Reichle, T. Rosenband, T. Schaetz, P.O. Schmidt, S. Seidelin, N. Shiga, J.H. Wesenberg, "Trapped Atomic Ions and Quantum Information Processing," *AIP Conference Proceedings* **869**, 103-110 (2006).
- [5] P.O. Schmidt, T. Rosenband, J.C.J. Koelemeij, D.B. Hume, W.M. Itano, J.C. Bergquist, D.J. Wineland, "Spectroscopy of atomic and molecular ions using quantum logic," *AIP Conference Proceedings* **862**, 305-312 (2006)
- [4] S. Schiller, A. Görlitz, A. Nevsky, J.C.J. Koelemeij, A. Wicht, P. Gill, H.A. Klein, H.S. Margolis, G. Miletí, U. Sterr, F. Riehle, E. Peik, Chr. Tamm, W. Ertmer, E. Rasel, V. Klein, C. Salomon, G.M. Tino, P. Lemonde, R. Holzwarth, T.W. Hänsch, "Optical clocks in space," in *Proc. III International Conference on Particle and Fundamental Physics in Space (SpacePart06), Beijing 19 – 21 April 2006, Nucl. Phys. B (Proc. Suppl.)* **166**, 300-302 (2007).
- [3] T. Rosenband, W.M. Itano, P.O. Schmidt, D.B. Hume, J.C.J. Koelemeij, J.C. Bergquist, D.J. Wineland, "Blackbody radiation shift of the  $^{27}\text{Al}^+ \text{ }^1\text{S}_0 - \text{ }^3\text{P}_0$  transition," in *Proceedings of the 20th European Frequency and Time Forum, Braunschweig, Germany, March 27 – 30, 2006*, pp. 289-291.
- [2] B. Roth, H. Daerr, J. Koelemeij, A. Nevsky, S. Schiller, "Ultracold Molecular Hydrogen Ions in a Linear Radiofrequency Trap: Novel Systems for Molecular Frequency Metrology," in *Proceedings of the 20th European Frequency and Time Forum, Braunschweig, Germany, March 27 – 30, 2006*.

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